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Paper TRADE JOURNAL

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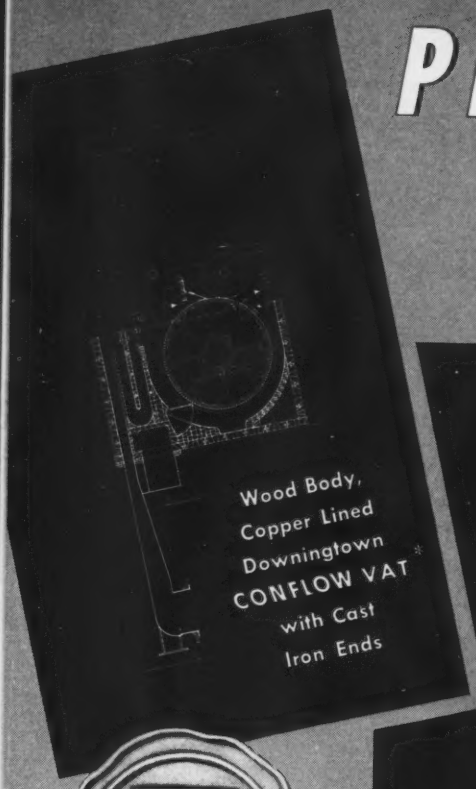
VOLUME 127, No. 16 OCTOBER 14, 1948

ASTEN DRYER FELTS

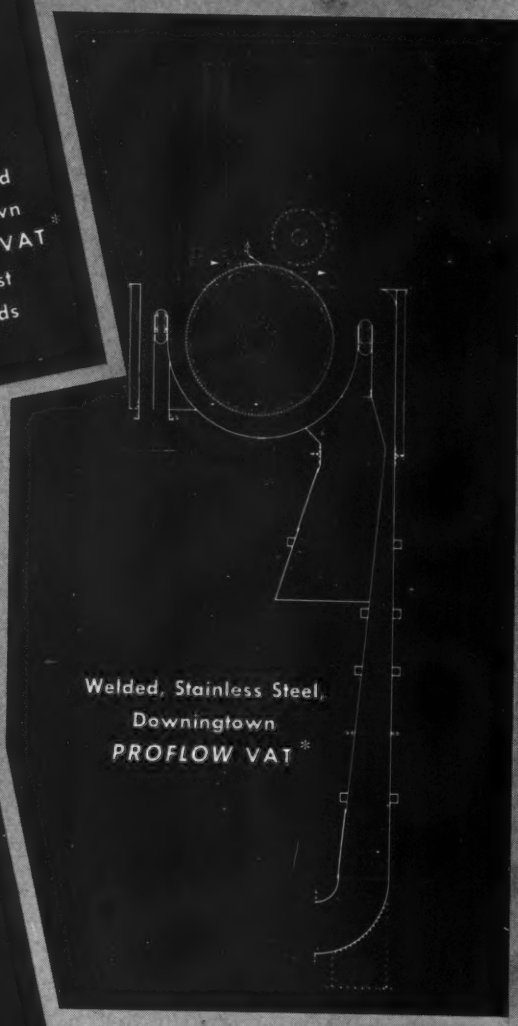
ASTEN-HILL MFG. CO., PHILADELPHIA • ASTEN-HILL LTD., VALLEYFIELD, QUE.

PROFLOW* and CONFLOW* Vats

New Names for Established Principle



Wood Body, Copper Lined Downingtown CONFLOW VAT* with Cast Iron Ends



Welded, Stainless Steel, Downingtown *PROFLOW* VAT*

Welded, Stainless Steel, Downingtown CONFLOW VAT* with Suction Slice

All Metal, Downingtown CONFLOW VAT* with Cast Iron Ends and Everdur Circle

Fundamentally, there are just two types of board machine vats, one in which the direction of stock flow is "with" the rotation of the cylinder mould, and the other, in which the direction of stock flow is "against" the rotation of the mould. Both types have been used for years, but the modern, improved Downingtown Designs in both types are different, so to identify them in the industry, we are naming them as follows: *PROFLOW* VATS* in which the direction of stock flow is "with" and CONFLOW VATS* in which stock flow is "against" the rotation of the cylinder moulds. Both types and all designs of Downingtown Vats assure continuous production of a well formed sheet of uniform weight and caliper. Write us.

* TRADE MARK

DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.

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Designers & Builders
Paper Making Machinery

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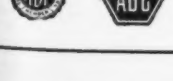

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OCT. 14, 1948

VOL. 127, NO. 16

Materials Handling and Packing Conference

Navy and Navy Industrial Ass'n.

BAYONNE, N. J.—Eight hundred visitors attended the Materials Handling and Packaging Conference at the Naval Supply Depot on September 28, sponsored jointly by the Bureau of Supplies and Accounts, U. S. Navy, and the Navy Industrial Ass'n.

Purpose of the conference was to promote better understanding and coordination between the Navy and the industries that produce and deliver its supplies. During the past year, advisory committees on materials handling and on packaging were set up by the association and the Navy's Bureau of Supplies and Accounts. The findings of these committees were presented at the conference.

Speakers included Admiral Louis Denfield, U.S.N., Chief of Naval Operations; Rear Admiral E. D. Foster, SC., U.S.N., Chief of the Bureau of Supplies and Accounts; and Commodore J. K. Richards, U.S.N. (Ret) executive director of the Navy Industrial Ass'n.

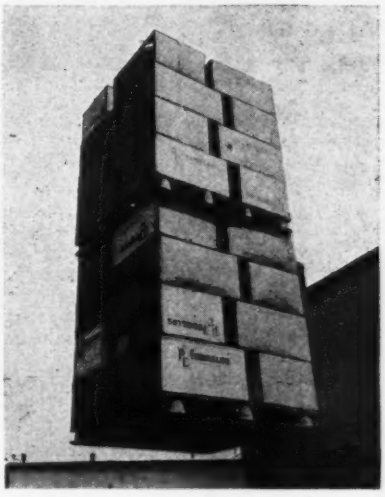
The above speakers were introduced by Capt. C. L. Austin, S.C., U.S.N., Supply Officer in command, Navy Supply Corps School. Capt. Austin also made the welcoming address on behalf of the Bureau of Supplies and Accounts.

Exhibits were set up in the gymnasium to illustrate specific problems in materials handling or packaging and commercial scale demonstrations were given at some of the warehouses and loading platforms.

The following exhibits were shown in the gymnasium:

Area A: This exhibit showed the inadequacy of the size of average freight car doorways for mechanized loading or unloading. Test loadings have shown that twice as much time and labor are required for the mechanized loading of a car with six-foot doors as that for a car with eight-foot doors. Every effort is being made to persuade the railroads and other purchasers of freight cars to specify doors not less than eight feet wide on all new equipment.

Area B: This exhibit was devoted to pallets. Since the word "pallet" has other meanings, we include the following definition of a pallet as used in industry.



Unit loads of Foamglas packed on Addison-Semmes expendable paper pallets.

"A pallet is a modern version of a platform skid requiring only a portion of former height, permitting mechanical tiering of assembled loads and utilizing a maximum of available storage headroom. In effect it is a movable section of floor on which a variety of products are stacked for storage and for movement from place to place by means of fork trucks, pallet hand lift trucks, and a wide variety of handling equipment."

The Navy standard pallet used during the last war was of 48- by 48-inches in area, two-way entry, and made of wood. Just after the end of the war, during the period when industry was becoming aware of modern materials handling methods on a large scale, it became increasingly evident that many factors of good pallet design were not incorporated in the Navy standard pallet and that industry was devising pallets with new properties and characteristics which warranted investigation. Therefore, a project was initiated and assigned to the Test and Development Department, Navy Supply Corps School here, for testing pallet characteristics and availability for possible Navy use.

Each type pallet, regardless of its construction, material, or specific design purpose, has been submitted to a series of 32 tests, including such items as lading capacity, suitability for bagged goods, shock loading, towing, and suitability for stevedoring operations.

From these tests it has been possible to devise a set of requirements for the new Navy standard pallet. These requirements are itemized as follows: *(a) Size 40 by 48 inches to permit movement by both railway freight car and trailer truck. (b) Four-way fork entry. (c) Sixty- to ninety-pound weight. (d) 3⅝-inch deck clearance for fork-truck forks. (e) Bottom deck area to be 60 per cent of top-deck area. (f) Provision for handling by hand pallet truck. (g) Capability of being knocked down in order to conserve shipping space. (h) Reparability by replacement of component parts. (i) Capability to withstand static loading of 12,000 pounds and ability to perform satisfactorily under naval handling operations. (j) Overhand of 3½ inches on 48 x 48-inch dimensions for application of stevedoring slings, forming what is known as a wingtype pallet. (k) Be moisture resistant to the extent that dampness will not seriously affect the strength and life of the pallet. (l) Permit strapping and/or gluing to the degree required in unit loading. (m) Be made from raw material readily available in time of war. (n) Price to be in balance with expected life of the pallet.*

Unit Loads

A new development in unit loading was shown here for the first time. This development is called *unit load without pallets.* It consists of forming strapped unit loads by leaving voids in the load itself for the entry for the forks.

Two test shipments of this type have been made to date, one of canned vegetable shortening from Jersey City to

(Continued on page 16)

Eighteenth National Power Show To Feature New Economies

NEW YORK — Components of the modern power plant featuring economy will dominate the most comprehensive display of its kind at the 18th National Exposition of Power & Mechanical Engineering in Grand Central Palace, November 29 to December 4.

In scale, exhibits range from packaged steam generators of ten to 100 horsepower or more up to apparatus of the largest sizes made for super power plants.

Major categories are: Heat and power production, means of distribution, auxiliary units, automatic controls, transmissions, materials handling, engineering materials, special machinery and tools.

Promoting Clean Combustion

Summarizing on a small scale many recent improvements in combustion control, the little steam generators, a number of which have been entered for display at the Palace, are remarkably complete and compact. One such exhibit is presented in a nearly full-scale animated model, illuminated to show the different phases of its operation. Another offers "the only packaged type steam generators which burn all automatic fuels — light oil, heavy oil and gas — with quick changeover from one fuel to another." A third offers "the only boiler in its class using the modern principle of forced recirculation. For this, it is claimed that the recirculation circuit employed produces 98 percent dry steam and that 150 pounds head of steam can be raised within three minutes from a cold start.

Highly intensified operating conditions in modern power plants, plus the crowding of diversified industries into populous areas has highlighted the water supply problem in connection with steam production and chemical processing. One exhibit featuring a new air operated chlorinator, is designed to show how such equipment, in capacities from a few ounces to 6,000 pounds per day can save fuel, labor and time through the elimination of slime in cooling water circuits. A new product in this year's exposition is a chemical that is said to prevent serious foaming in concentrations as low as eight parts per million. The same exhibitor is offering a steam purity recording device and also presenting a visual demonstration of the action of fuel oil treatment in sludge elimination.

On the side of water treating equipment, there is the display of widely known flow responsive and constant rate proportioning devices to which has now been added an automatic control of proportioning pumps.

"The world's only device for sterilizing water without heat or chemicals and without imparting any bad taste or odor" is the focal point of a display of ultra violet light equipment. Up to 100,000 gallons of water can be treated for a penny's worth of electricity by this method, it is claimed.

There are a number of new things to be seen in the way of boiler feeds. One is a variable speed fluid drive in the range of 500 to 2,000 horsepower. Similar drives are used to power various kinds of machinery. There is also an exhibit of steam turbine centrifugal pumps of improved type which are widely used on ships. Over a thousand marine installations of this style of equipment have already been made, it is said.

High pressure reducing valves, capable of reducing any pressure up to 2,200 pounds gauge, engine stop equipment for overspeed control on steam engines, water columns, gages, valves and flow indicators; and a display of vacuum and condensate units, castings, soot blowers and pipe-line ash conveyors are a few of the many different kinds of specialties which may be seen at the exposition.

An automatic coal scale insures feeding the correct amount of coal to individual boilers and can be used to record the weight of coal consumed by each unit. An improved type of spreader stoker has an electric hydraulic drive, regulated by automatic controls through a hydraulic valve. This equipment is provided with an alternate pusher coal feed, which provides for continuous feeding of coal revolving distributors. In the fuel handling category there will also be shown a giant plate magnet for removing tramp iron from gravity coal chutes without the use of electrical connections.

Many varieties of furnace and pipe insulation are on the exhibitors' list, including asbestos and magnesia pipe and block insulations, and also asbestos electrical insulations, asbestos - cement structural sheets as well as asbestos-cement pressure piping. Insulating products using diatomaceous earth are a post-war development which has been worked out in a full line of high- and low-temperature insulating materials, having many new applications, a number of which will be exhibited.

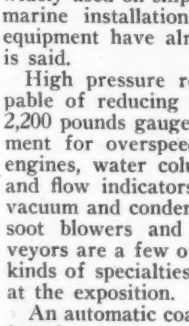
In a newly designed line of chrome-molybdenum steel valves with pressure-sealed bonnets, it is said that flow has been increased up to 30 percent and pressure loss lowered by 40 percent. In another new line of valves, lighter in weight, easier to install, a flangeless bonnet type of construction has been adopted with special reference to the requirements of high-pressure, high-temperature service. A new line of meter, check and globe valves in forged steel is making its appearance at the exposition.

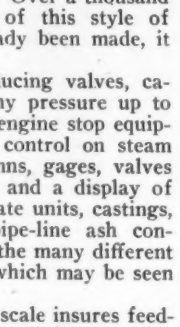
Smoke Abatement Economies

One exhibitor of an electronic control system actuated by varying smoke density is able to cite case histories showing fuel savings of 14 to more than 20 percent, simply through automatic adjustment of the fuel-air ratio.

Among automatic controls in one instance will be the demonstration of an oxygen recorder; at the same booth a single recording instrument will measure differential pressure, two temperatures and speed. While several systems of control are electrical, one of the most widely known manufacturers in the instrument field has a line of controllers which are air operated under the guidance of instruments which also record the various functions which they measure.

Another display includes electrical measuring instruments from inexpensive panel meters to the latest designs in precision types of test instruments, pyrometric controllers, industrial power analyzers, Gieger counters and others. Interval timers, reset timers, time delay relays, cycle timers, pulse timers, running time meters and other instruments are featured in another display, where also a new timing motor is to be shown. This is a newly developed self - starting synchronous motor designed to fill the gap between the ordinary low - torque clock motor and the fractional horsepower group.





TWO DILTS MEN UPPED

R. F. Vokes, left, recently appointed assistant general manager of the Dilts Machine Works, Fulton, N. Y., division of the Black-Clawson Co., is being succeeded as director of laboratories by G. B. Nicholson, Jr. . . . Mr. Nicholson, right, joined Dilts after graduating from the New York State College of Forestry. His career there was interrupted by World War II, in which he served as a first lieutenant. Returning to Dilts, he was assigned to the order department and in 1947, was shifted to the research and development department.

Variable Drives

One of the lines of power plant equipment that continues to reveal development in several directions is that of transmissions, especially variable drives. These are offered in great variety by exhibitors at the Palace, ranging in scope from chemical feeders, through motor-driven boiler feed pumps, in which the rate of feed is adjusted by varying the drive ratio; conveyor and stoker drives and drives applicable to a great many different purposes in machinery used for manufacturing and processing operations.

The American Leather Belting Ass'n. will have a display of new motor bases for belt-driven applications, demonstrating "the sure grip of live traction belting" and illustrating how flat belts can be adapted to short-center drives, while a rubber manufacturer will show a new cog belt built for transmission drives demanding maximum compactness, smallest possible pulleys and shortest centers. Another rubber manufacturer will have a new speed selector for low power drives in which an infinite variation of driven speeds is obtained by a combination of a planetary motion, two V-belts and four variable pitch sheaves. This provides any speed from zero to 800 revolutions per minute at constant torque.

Electric motor displayed in one exhibit will feature a compact variable speed drive that is free of complicated mechanisms and electrical control systems, a specially geared motor drive giving low-speed, high-torque characteristics, vertical hollow shaft motors, explosion proof motors. Shock protection of motors when driving compressors or other equipment having an impact factor in the load is offered in one instance by rubberized rope drives. The effectiveness of this type of transmission for the purpose indicated will be demonstrated at the exposition by means of the oscilloscope.

Engineering Materials

Featured in the exposition will be exhibits of advanced materials, among them an informative display of a patented condenser and heat exchanger tube that has remarkable resistance to dezincification, along with cupro-nickel condenser tubes, bi-metal tubes, red brass pipe, and such specialties as copper hammer heads and nails, brass lag screws, silicon bronze bolts and nuts, copper wire and cable, as well as magnet wire. Another exhibit will feature pressure tubing, boiler tubes, heat exchanger, condenser and evaporator tubing in stainless steel. Still another, custom sand castings in Hecla Bronze, Everdur and Bell-Nerculoy.

Important from the standpoint of plant maintenance are the several exhibits of pipe tools, pipe machines and power units.

Specialties to be Featured

Among specialties to be featured is an improved condenser that helps refrigeration plants operate at lower

(Continued on page 42)

HAVING FUN. Left to right: Merton C. Flemings, resident manager of the Chas. A. Esty Paper Co., Worcester, Mass.; Frank Cummings, treasurer of the New England Paper Merchants Ass'n.; Al Logan of the Providence Paper Co., Providence; Harry Westwater of the Industrial Paper & Cordage Co., Pawtucket; and George Gordon.

New Englanders' Wannamoisett Frolic

BOSTON — The New England Paper Merchants Ass'n. outing on September 28 at the Wannamoisett Country Club, Providence, R.I., attracted 127 members and guests among whom were many mill representatives.

The golf tournament, managed by Frank Holden of the Rourke-Eno Paper Co., Hartford, saw some 67 players tee off. Other sports included bowling-on the green, horseshoe pitching, putting and card games.

Following dinner at 6:30, prizes were awarded as follows:

Golf, first low net, Richard Swain; second low net, Ben Volk; first low gross, Charlie Boyd; second low gross, Payson Lowell; low putts, S. A. Howell; high putts, Bill Snyder; high net (honest man), Edgar Hay; high gross (hardest worker), Don Gibbs; hole in one (nearest on third hole), Harold Simmons; longest drive (off first tee), H. D. Rodd.

Kickers handicap (70-80 inclusive), 1st, Jack Ingalls; 2nd, E. L. Cummings; 3rd, H. P. King; 4th, George Morrison; 5th, Paul Jones; 6th, Nick Pagano; 7th, Warren Young; 8th, Jack Whitney; 9th, Ray Oakley; 10th, C. F. Sullivan.

Awards were made by Charlie Brown (Providence Paper Co.) of the prizes committee, and Chairman Holden, the latter being given a special prize "for devotion to duty."

Bowling-on-the-green, 1st prize, Fred May and Walter Davis; 2nd, Harry Westwater and Frank Cummings. Awarded by Thompson Steen, of prizes committee, and Merton Flemings, of bowling committee.

Horseshoe pitching, 1st, Royal Teele; 2nd, Sam Walker. Awarded by Thompson Steen (Service Paper Co., Pawtucket) and Fred Profit (Industrial Papers, Inc., Worcester) of horseshoes committee.

Putting contest, 1st, Marvin Campbell; 2nd, Frank Merrill. Awarded by Thompson Steen, of prizes committee, and Harold Simmons (Industrial Paper & Cordage Co., Pawtucket, R.I.) of putting committee.

Three door prizes also were drawn and awarded by Abe Goldstein of Woonsocket, R.I.

Assisting Jim Gardner as general chairman of the outing were (in addition to those mentioned previously): James C. Campbell, LeRoy M. Gardner, James T. McGowan, Neil S. Beckwith, Earl M. Norcross, William H. Lippman, Samuel Toabe, Arthur C. Biza, George E. Bliss, William M. Crouch, James J. Dwyer, W. Edwin Porter, E. L. Cummings, Harry S. Mayberry, Richard S. Anderson, Sterling R. Chatfield, Lester D. Lott, Leon M. Poore, Samuel L. Ginsburg, and Walter G. Butler, representing the six New England States.

Cornerbrook Rolling

CORNERBROOK, N. F. — What is termed "the largest newsprint manufacturing machine in the world" went into production on October 15, Sir Eric Bowater, chairman of Bowater Paper Corp., Ltd., reports.

United States Pulp and Paper Manufactures

Month of August 1948

Paper and board production reached 1,873,800 tons in August 1948, according to the Bureau of the Census, Department of Commerce. This figure was 185,410 tons over the corresponding figure for July, and 110,372 tons above the production recorded for August 1947. Paper output was 937,150 tons, or 93.7 percent of the production base, while the ratio of paperboard production to the base was 90.5 percent. Building board output continued at near capacity, as production equalled 99.7 percent of the base.

Pulpwood receipts during the month, at 2,256,375 cords, continued to reflect the seasonal increases in the northern regions. This high rate of receipts enabled the mills to increase their month-end inventories to 5,321,246 cords despite the consumption of 1,886,386 cords, two new highs for the industry.

Receipts of fibrous materials other than wood pulp during August, at 795,394 tons, were nearly 100,000 tons over the receipts of these materials in July. The receipts of straw continued to show their usual seasonal increase. Waste paper receipts, although above those of July, were again insufficient to meet the demands, thereby further reducing the month-end inventories of the consuming mills. Based on the August rate of consumption, these stocks are equal to 21 days supply.

Wood pulp production in August established a new record high at 1,143,174 tons, 94.4 percent of the production base. The sulphate grades, at 545,364 tons, showed the largest increase, reflecting the stepped up activity of the new capacity in these grades. The return to normal operations after the July shutdowns accounts for the increases shown in the other grades.

Wood pulp inventories at paper and board mills dropped 8,172 tons during the month despite an excess in receipts over consumption of 1,266 tons. This decrease in inventories was due to the sale and transfer of pulp by paper and board mills. A slight increase in the month end inventories at the integrated mills was more than offset by decreases in the partially and nonintegrated mills. The latter group of mills withdrew 12,547 tons from their stocks in order to meet consumption requirements. Pulp mill inventories increased by 2,620 tons.

Material consumption and product output ratios again emphasizes the swing from waste paper to wood pulp in the production of paperboard. Wood pulp, which in January 1948 accounted for 41.5 percent of the fibrous material "furnish" for paperboard, now accounts for 48.5 percent of the fibrous material content.

U. S. PAPER AND BOARD: PRODUCTION, BY TYPE, AUGUST 1948

(Tons of 2,000 pounds)

Type of paper	1948 August[1]	1948 July*	August 1947
ALL TYPES, TOTAL	1,873,800	1,688,390	1,763,428
Paper, total	937,150	859,376	891,752
Newsprint	76,152	72,823	69,535
Groundwood printing and specialty paper, total	66,806	64,517	69,484
Printing	42,450	41,519	43,419
Converting	22,383	21,263	19,981
Other	1,973	1,735	6,084
Book paper, total	187,453	173,410	181,079
Printing	142,447	130,858	134,023
Converting	38,667	36,471	44,504
Other	6,339	6,081	2,552
Fine paper, total	99,915	88,191	103,610
Writing, total	74,038	65,286	75,993
Rag (including index)	11,003	8,575	15,261
Chemical wood pulp	63,035	56,711	60,732
Cover and text	6,376	5,696	8,379
Bristols (except rag index)	12,483	10,230	11,584
Thin	5,375	5,352	5,768
Other	1,643	1,627	1,886
Coarse paper, total	274,470	243,161	247,641
Glassine, greaseproof and vegetable parchment	10,041	9,368	11,297
Wrapping, total	66,691	61,657	68,659
Unbleached kraft	31,672	29,346	29,243
Other	35,019	32,311	39,416
Bag, total	63,032	53,726	51,595
Unbleached kraft	58,089	48,844	47,869
Other	4,943	4,882	3,726
Shipping sack	58,332	54,072	47,976
Converting, total	76,374	64,338	68,114
Unbleached kraft	44,595	37,431	38,782
Other	31,779	26,907	29,332
Special industrial	21,701	19,071	19,602
Sanitary	79,808	76,782	71,793
Tissue	18,962	17,741	18,506
Absorbent	8,468	7,490	8,260
Building paper	103,415	96,190	102,242
Paperboard, total	799,381	694,208	754,993
Liners	315,568	258,540	256,852
Corrugating material	101,110	101,306	114,605
Container chip and filler board	25,778	27,441	29,020
Folding boxboard (for use in folding box plants only)	175,309	151,095	178,898
Set-up boxboard (for use in set-up box plants only)	48,009	37,342	50,675
Cardboard	7,299	5,732	4,763
All other paperboard	126,308	112,752	120,180
Wet machine board, total	10,364	8,909	11,523
Shoe board	4,003	3,539	4,402
Binder board	3,081	2,516	5,037
Other	3,280	2,854	2,084
Building board	126,905	125,897	105,160

* Revised.

[1] These data are estimated to give 100 percent coverage of the industry. The proportions of estimate are as follows: Fine paper, 3 percent; Special industrial, 3 percent; Sanitary, 12 percent; Tissue, 12 percent; Absorbent, 3 percent; Folding boxboard, 3 percent; Set-up boxboard, 7 percent; Cardboard, 4 percent; Wet machine board, 12 percent; Building board, 5 percent; and All other grades of paper and paperboard, less than 3 percent. Data for August are preliminary and will be revised in the September report. *Source: U. S. Dept. of Commerce.*

Dickinson to Canada

OTTAWA, Can.—J. Dickinson & Co., one of the largest fine-paper manufacturers in Britain, it is understood here, is planning to establish a plant in Canada and it is possible that this may be accomplished by capital being made available through proceeds of the interest-free loan arranged between Canada and Britain in 1946, though originally it was said that this and other projects might be arranged under special transfer agreements worked out by an insurance company for use of its sterling funds in the United Kingdom.

Mylrea Appointed

WASHINGTON—Appointment of John D. Mylrea, treasurer and director of the Mosinee Paper Mills Co., Mosinee, Wis., to a new forest products division of the National Security Resources Board, was announced on October 9. He will be responsible for planning industrial mobilization in his field for the NSRB, for use in event of any future emergency.

Flames Demolish Kieffer Paper Mills

An early morning fire of undetermined origin, discovered in a processing room, demolished the plant of the Kieffer Paper Mills at Brownstown, Ind., on September 26, causing a loss estimated at $1,200,000. The loss, partly covered by insurance, included patents on Shoksorb products made by the company and which were designed and created by John A. Kieffer, treasurer of the firm. Also the company's supply of waste paper, and about $28,000 worth of finished paper.

Wrecked by the fire were three paper making machines, one installed in 1890, another in 1912 and the third in 1920.

A new brick-and-concrete addition, about one-third the size of the main one-story brick and steel plant, being completed in front of the old plant, was not damaged. The offices are in this addition. Also surviving the fire is the boiler room and smokestack. A ware-room and its contents, adjacent to the Baltimore & Ohio Railroad tracks was slightly damaged.

Heart of the blaze was terrific, melting and twisting the huge steel girders which had supported the factory roof, and melting parts of the machinery inside the factory. Some of the brick walls collapsed during the fire and bricks on others were crumbled from the top as the roof caved in during the blaze.

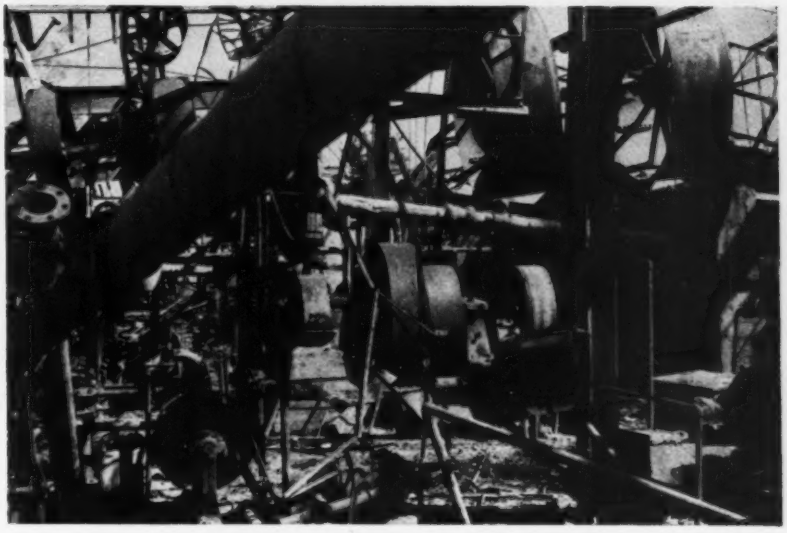
The Kieffer Mills manufactured Shoksorb, an indented paper used by manufacturers to pack their products. The mills also manufacture wrapping paper, crepe or cushioning type paper and a car-liner. Capacity was 30 tons per day and the firm did a $1,500,000 business last year.

The mill originally made paper from straw in 1900. After it went bankrupt in 1904, Mr. Kieffer took over in 1905 and began making products from waste paper.

The mills hold five patents in the "Shoksorb" line.

Val J. Goessling of St. Louis is president; Miss Edna Robertson of Brownstown is general manager and Thomas Kieffer of Brownstown, assistant manager.

Plans for continuation of the business have not been disclosed.



Twisted steel and crumbled walls give mute testimony of the fierceness of the fire which ravaged the Kieffer Paper Mills, Brownstown, Ind., on September 26, as shown above.

Pittsburgh-Plus

WASHINGTON — The U. S. Circuit Court of Appeals for the Third Circuit (Philadelphia) on October 5 entered a consent decree affirming and enforcing the order of the Federal Trade Commission directing the United States Steel Corp., New York, and its subsidiaries to discontinue use of the "Pittsburgh-plus" basing point system of fixing prices for rolled steel products, or any similar system by which price quotations are based on any basing point other than that where the products are manufactured or from which they are shipped. The order also contains a prohibition against price discrimination which results in substantial lessening of competition either among steel producers or steel users, or both.

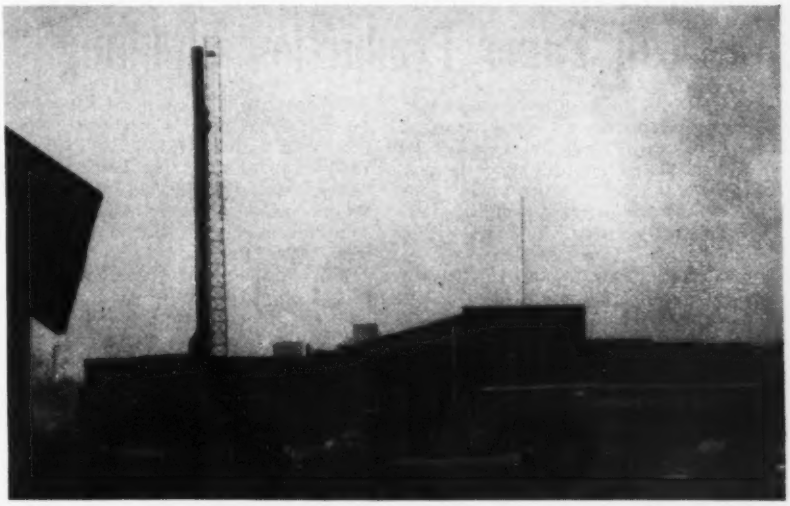
Wage Merry-Go-Round

NEW YORK—Strong indications that a fourth round of wage increases is getting under way are contained in the results of a study of over 600 union contracts negotiated during the past 60 days. The analysis reveals that 63 percent of the companies involved in contract renewals granted fourth-round wage boosts, and the average pay hike was close to 9½c an hour. The remainder of the agreements studied were still in the third round category, the Wage Research Division of the National Foremen's Institute, reports.

Halt Mill Building

ANTIOCH, Calif.—First strike action in the dispute between the AFL Boilermakers' Union and 369 construction firms in seven western states was reported here on September 29, where field construction workers walked off their jobs at two paper mills under construction.

The mills are owned by *Fibreboard Products Inc.*



Kieffer Paper Mills plant as it appeared before fire and before new addition (which escaped the flames) was started.

Left to right: Joe A. Marks and D. K. Beer, both of the General Paper Co., Baton Rouge, with F. K. Doscher, vice-president of the Lily-Tulip Corp.

Big Biloxi Turnout

BILOXI, Miss. — The 25th annual meeting of the Southern Paper Trade Ass'n., held at the Buena Vista Hotel, September 23-25, drew a registration of 121 persons.

Speakers included F. K. Doscher, vice-president of the Lily-Tulip Corp.; W. G. Leathers, executive assistant of the National Paper Trade Ass'n., and others.

Retiring President Mayer Myers presided at the banquet, and Hugh O. Smith introduced the guest speaker, Clayton Rand, editor, author, and speaker. During the banquet Mrs. Albert Smith of West Carrollton, Ohio, sang. After the banquet a dance was held on the "deck" of the hotel.

Incoming officers elected are: President, Ran I. Fox, of the D & W Paper Co., New Orleans; first vice-president, Charles Liebman, National Paper Co., Atlanta; second vice-president, Robert Roach, Roach Paper Co., Little Rock; treasurer, H. T. Newell, Jackson Paper Co., Jackson, Miss.; and acting secretary, Sara Meredith, Jackson Paper Co., Jackson. The directors elected at this meeting are: H. Palmer Webb, of the Central Paper Co., Jackson; Tom Johnson of E. C. Palmer & Co., New Orleans; and Gardiner Young of the Bancroft Paper Co., Monroe, La.

Activities during the three-day session included a bingo party for the ladies and a boat cruise on the Gulf of Mexico.

Mexican Paper Production Climbing

WASHINGTON — Announcement that paper and paperboard production at Mexican mills will reach 136,383 tons this year, based on present estimates, calls attention to the increasing importance of the Mexican pulp and paper industry in that country.

The Dept. of Commerce has just reported on operations of this industry in 1947 with projections for 1948, pointing out that all during 1947 Mexico's pulp and paper industry worked at maximum capacity with 3 eight-hour shifts daily. Despite a business recession in the country, it was recalled, no adverse effects were felt by the paper mills.

Production in 1947 of paper and paperboard amounted to 105,728 tons, of which paper accounted for 70,302 tons, with emphasis on output of wrapping and other coarse papers. Pulp production in 1947 was 51,108 metric tons (2,204.6 pounds per ton) which compares with slightly over 27,000 in 1946. The estimate for 1948 is 68,294 metric tons, of which 42,750 tons will be unbleached sulphate, 4,800 bleached sulphite and 17,934 will be mechanical pulp.

Mexican pulp imports last year comprised 36,736 tons of chemical, with most of the pulp coming from Sweden and the U.S. This country also furnished 1,210 tons of waste paper to Mexico last year.

Mexico began actual exportation of pulp last year, 6,797 tons of unbleached sulphate, which was imported by this country.

This year, chiefly because of increased import duties, it is expected, imports of paper and related items will generally fall below the 1947 level. However, the United States appears to be supplying an increasing proportion of Mexico's total paper and paperboard imports, it is reported. Although 1947 imports declined from earlier years, imports from the United States represented 48.6 percent of the total quantity, and 64.7 percent of the total value.

Demand last year for both imported and domestic paper and paperboard exceeded supply, and despite small export amounts, the home market is not sufficiently supplied, it is stated. Consumption estimates for 1948, totaling 210,427 metric tons of paper and paperboard, and including 55,000 tons of newsprint, contemplates that imports will show an approximate 30 percent drop for the year, compared with 1947, also that domestic production will increase substantially.

Increased production last year was due to increased facilities, it is pointed out, since all mills worked at capacity. Besides mills which began intensive activity in 1947, a long-established mill began installing additional equipment in June, this year, including a modern 134 Fourdrinier for lightweight papers, a mechanical pulp mill, a steam power plant, and accessory equipment.

Another mill, in the Federal district as was the above, put one machine in operation earlier this year, with a second in process of installation in June. This mill will produce coarse wrapping paper and paperboard from waste paper; no imported pulp will be required, it is said.

However, another paperboard plant, at Tealnepantla, Federal District, is expected to begin operations late this year, and will use imported pulp. In the same area, a plant making cigarette paper and various types of tissue, is expected to begin operations during this year, but has not been reported on finally.

Paperboard Meet

CHICAGO—The Annual Meeting of the National Paperboard Ass'n. has been called to be held at the Waldorf-Astoria Hotel, New York City, November 11-12. A meeting of the Association's board of directors is scheduled for November 11.

George E. Dyke, president of Robert Gair Co., Inc., New York City, is President of the Association. W. H. Beckwith, vice-president and general manager of the Morris Paper Mills, Morris, Ill., is vice-president of the Association.

Wholesalers' Sales Up

WASHINGTON—Wholesalers had an August business of $8,063,000, 14 percent above July and four percent higher than a year earlier, the Bureau of Census reported on October 4, based on a sampling of business of 61 firms. Sales of the group for the first eight months this year rose one percent compared with the same months of 1947. August inventories of 21 reporting firms were 33 percent higher than a year earlier.

Newsprint Canada's Biggest Industry

Capital Investment, $1 Billion; Annual Payroll, $115 Million

TORONTO — Discussions involving Canadian trade cannot proceed far before the subject of pulp and paper is raised. Pulp and paper is the largest manufacturing industry in Canada with an invested capital of approximately $1 billion.

Last year gross value of production by the industry was close to $700 millions; and about $530 millions of this went to the export market.

In Canada, the 113 pulp and paper mills employ nearly 50,000 Canadians on a full-time basis and this year gave part-time work to another 192,000 woods workers. Salaries and wages to full-time employes total approximately $115 millions annually.

Pulp and paper companies are the largest buyers of transportation and electrical power in Canada and are among the largest purchasers of fuel, agricultural products and chemicals.

U. S. Big Customer

What does this mean to Canadian trade? It means that 50,000 Canadians and their families have the money to buy the consumer goods which the British, American or European salesmen have to offer.

Practically all of the country's pulp and paper exports go to United States, bringing in U. S. dollars which in turn help to pay for the raw materials which Canada must buy in the United States to keep its wheels turning.

Last year, it is estimated, newsprint exports alone brought in close to $400 millions U. S. funds. Overall it is safe to say that about 45 cents of every American dollar that came to Canada from the export of goods to United States was brought in by pulp and paper exports.

Canada uses a good part of its U. S. funds to purchase coal, raw cotton, oil, etc., in United States.

60% Of World Supply

Newsprint is the most important of the pulp and paper products from the standpoint of production and exports. In 1947 newsprint production totaled more than 4.4 million tons.

This was the highest production on record and newsprint mills operated at 102.2 percent of capacity to do it This year Canada will likely produce slightly in excess of this figure or about one-half of total world production.

Along with Newfoundland, the two countries will produce close to 60 percent of the world's supply.

In the 25 years from 1925-50 Canadian newsprint capacity has shown an average increase of 116,000 tons a year compared with an average increase of 86,000 tons in the rate of demand. In one five-year period—1925-30—it more than doubled—from 1.7 millions tons to 3.6 millions tons.

In the depressed '30's, however, the demand for newsprint along with that for many other commodities fell off drastically and for about ten years Canada had standing idle about one million tons of capacity.

Today Canada is in a new stage of capacity expansion albeit of more modest dimensions than that which occurred in the 1920's. Rated capacity in 1947 was 4.3 million tons and it is estimated that this will increase to 4.6 million tons in 1950.

82% To United States

Where does this production go? Last year 82 percent of Canadian newsprint shipments went to the United States, 12 percent to United Kingdom and other overseas countries and six percent to Canadian consumers.

When European countries experienced an acute shortage of newsprint last year it was due to idle capacity on the continent rather than a decline in Canadian overseas shipments.

The fact that practically all of the increase in Canadian production is going to U. S. is due for (a) increased U. S. consumption and (b) declining U. S. production.

Unbalanced Supply

There is no question that there is a decided unbalance in the supply of newsprint among the countries of the world. In 1948, for example, out of an estimated total world production of 8.1 million tons, the U. S. will consume about 5.1 million tons.

This unbalance can be attributed to a shortage of U. S. dollars or convertible currency and to idle newsprint capacity in Europe and Asia.

It is estimated that there is 1.5 million tons of idle machine capacity in 1948. In United Kingdom, for example, the newsprint industry is working at only 24 percent of capacity due to the low level of woodpulp imports from Scandinavia. In Europe the shortage of fuel, principally coal, has hampered the rehabilitation of several mills.

Canadian mills hold long-term contracts with U. K. customers for a much greater tonnage than was delivered. In the cast of other countries token shipments have been made where possible. But practically all Canadian newsprint is sold under long-term contracts with U. S. customers and these customers want all that the mills can produce.

Price Below World Level

And while the demand for newsprint has reached unprecedented levels the present contract price of $96 per ton is still well below the open market prices. Supporting the four-million ton newsprint industry is a still bigger pulp capacity. Last year the country produced something over seven million tons of pulp of various types. A large percentage of this was groundwood used in newsprint production.

Sulphite pulp is estimated at around 1.7 million tons and sulphate pulp about 740,000 tons. Probably the greatest expansion in Canada's pulp and paper industry is presently taking place in the sulphate pulp division. By 1950 it is likely that sulphate capacity will have reached the million-ton mark.

Like newsprint, practically all of Canada's surplus pulp production is exported to the United States.

In addition to newsprint and pulp, however, Canada produces all of its domestic requirements for fine papers, kraft, board, etc., but at present the capacity for the production of these grades does not permit any notable quantity for export.

There is at present a significant body of opinion which feels that Canada should expand its capacity of fine papers as a means of increasing U. S. dollar receipts.

Forests in Canada cover about one and a quarter million square miles and about two-thirds of this are productive. About one-half of the productive forests are accessible and these cover an area of aproximately 435,000 square miles—about twice the size of the province of Ontario. Regions now regarded as inaccessible are estimated to contain 100 billion cubic feet of softwood. These, however, are only temporarily inaccessible since wood from the area will be available once transportation is provided.

Canada consumes annually about eight and a half million cords of pulpwood from a total production of about 10.5 million cords. The balance is exported.

To preserve and conserve the raw material essential for their operation, most pulp and paper mills are now cutting their pulpwood on a perpetual yield basis.

Canadians know that they have a big stake in the preservation of the forest. They know that approximately $25 out of every $100 of primary Canadian wealth and income comes out of the forests and that $45 out of every $100 of U. S. dollar exports comes from pulp and paper.

Loss of Canadian timber resources would mean a serious blow to world trade and recovery.

Materials Handling

(Continued from page 9)

Norfolk and one of canned coffee from Brooklyn to Norfolk. Photographs of the shipment were exhibited as well as sample loads. This development has aroused great interest, as shipments in this manner can be accomplished without paying the commodity rate for the weight of the pallet and without paying freight rate on the return shipment of the unburdened pallet. As the Navy operates on a pallet pool basis the return freight economy is not important. However, the use of unit loads without pallet may be a vital factor in continental shipments during national emergency when pallets may be in short supply.

Area C showed developments in fork trucks. It was stated above that the pallet is the basic tool of the modern mechanized materials handling system. The second basic item of equipment which must be used to form the system is the fork truck.

The fork truck is not new. Although the first trucks were built following World War I, they did not achieve wide recognition until a few years ago. The advances in design have been rapid. During 1947 the industrial truck industry showed a business volume of $115,000,000 and is still growing. As the truck developed, so did a complete lack of standardization of controls and capacity ratings. Today the industry can no longer be considered in its formative stages. As an accepted commercial activity it should market trucks of generally similar specifications, it was stated. Discussions of standardization of fork truck controls have taken place in meetings of the Materials Handling Advisory Committee. A Task Committee has been formed to confer with the various manufacturers of fork lift trucks in an attempt to standardize controls, preferably along the lines devised by the automotive industry. From the standpoint of both efficiency of operation and safety of personnel, disadvantages of opposite steering directions and brake leverage action among the various type trucks are obvious. Also, operating controls should be located in a similar position on all trucks to eliminate confusion when operators are interchanged, it was pointed out.

The exhibit showed a mock-up of a standard set of fork truck controls, along the lines of the conventional automotive type which the Navy believes to be the criterion for standardization.

Also exhibited in this area was the test procedure of a project under way at the Test and Development Department, Navy Supply Corps School, entitled, "Nonskid Fork Truck Tires." The necessity for fork truck tires with increased nonskid properties was first evidenced when using a truck in the hold of a cargo ship to tier palletized cargo. The skidding resulting from the ordinary, smooth, hard-rubber tire not only was a personnel safety hazard but also appreciably decreased the efficiency of the operation. Nonskid properties are also of value in ordinary warehouse operations on wet or oily surfaces and when running loaded trucks up or down approach ramps.

When planning this project, contact was made with the major tire-manufacturing companies, indicating what was to be done and requesting that specially designed tires be submitted for comparative tests to discover what type of tread or surface would best meet the requirements. Eighteen sets of test tires were submitted and tested; however, the results are not as yet complete.

One other exhibit is included in this area. It is a conventional engine fitted with a special catalytic-type muffler which eliminates carbon monoxide fumes from the exhaust gases of gasoline-engine-driven fork trucks. This development was prompted by the necessity of eliminating the concentration of carbon monoxide in confined spaces when using gasoline trucks. This is particularly important when operating trucks in the holds of cargo vessels or in dehumidified warehouses which have been modified for long-term storage of emergency materials.

Area D was concerned with the development of the cargo ship along lines more compatible with the handling of unit loads.

Area E showed the packaging section of the exhibition.

Although the Packaging Advisory Committee has not as yet had an opportunity to consider many individual problems concerning the technicalities of packaging, they have devoted much time to the simplification of packaging specifications. It is realized that to do a proper packaging job the specifications must be written in a manner assuring understanding by the men actually performing the packaging. Included in the packaging demonstration were examples of materials packed by the 1, 1A, 1B, and 11 methods. These methods show such items as the grease-proof pack, plastic pack, and the moisture-vapor-transmission-proof barrier types.

Area F included a demonstration of the formation of glued unit loads and testing of unit loads on a Conbur impact tester.

CYANAMID APPOINTMENT

Arthur J. Campbell, new division manager of the Industrial Chemicals Division of the American Cyanamid Co., New York City, was formerly general sales manager of this division.

Formation of unit loads by gluing the cartons together rather than strapping was used successfully during the last war for the shipment of various items packaged in paperboard containers. The expensive and time-consuming strapping operation necessary at the origin of the shipment can often be eliminated if it is possible to form the load by gluing. In most manufacturing production lines the finished loaded container, especially of canned goods, enters the warehousing or shipping department on a roller-type conveyor. It is possible to adapt a glue applicator to the last conveyor section so that the containers can be taken from the conveyor and formed into a unit load with the glue applied automatically. The gluing methods used during the war were not entirely satisfactory and often resulted in an improper bond, allowing the load to break down in transit or necessitating tearing the carton when disassembling the load.

The operation of a roller-type glue applicator incorporating temperature control of the glue pot and micrometer adjustment of the glue film thickness was demonstrated in this area. By controlling these factors it is possible to apply the glue in the proper amount to hold the load securely bonded without applying too little or too much.

The Conbur impact tester shown in this area, consists of an inclined track upon which a dolly carrying one unit load is allowed to travel, by the force of gravity, into a barrier at the lower end. This test is used to determine the degree of bonding of a unit load as well as container and pallet strength. Before the construction of the Conbur impact tester it was necessary to load a freight car with unit loads to be impact tested and actually hump the car to achieve the desired results. The Conbur equipment is now used as a screening device for the boxcar humping test and eliminates many expensive car loadings.

Of particular interest to the paper industry was an exhibit of Addison-Semmes expendable pallets. These pallets are made entirely of corrugated board as shown in the illustration. They consist essentially of double-walled corrugated decks glued to convolutely wound single-faced corrugated posts. These posts range in diameter from five to eight inches. Each of the larger size posts will support a load of 4,000 lbs. The number of posts varies from four to 16, depending on the use requirements. Thus a 40" x 48" pallet with 16 posts may be capable of supporting a load of 64,000 lbs.

Principal advantages of these pallets are low cost and light weight. The cost of the pallets is only about 25 percent of that of a wooden pallet and they weigh about only ten pounds as compared to 80 to 120 pounds for wooden ones. Of course paper pallets are not suitable for all uses but where practical they may produce a considerable reduction in handling cost.

The Oldest Wood Pulp and the Newest

By ROBERT E. CANFIELD
Secretary-Treasurer, Groundwood Paper Manufacturers Ass'n.

When I was first asked by Mr. Parsons to talk to you here tonight, I asked why of all people request a lawyer and a trade association person to talk about groundwood to a group of scientific and practical groundwood experts. I got a fine sales talk but no intelligible answer. I think you are entitled to know why, but I am afraid you will have to ask the question of your own responsible officers. All I can do is tell you why I said yes.

As I have indicated, it seemed to me incongruous at the time, and it did to others too. Despite this, I said yes because it seemed to me that you and I do have a common interest. We are both interested in groundwood pulp and groundwood paper. If we weren't, none of us would be here. Both you and I to a greater or lesser extent get our living out of our interest in groundwood pulp and paper. We both eat at the same table, and both you and I are thoroughly interested in seeing that we continue to do so. To be sure, we sit at opposite ends of the table, but perhaps because we do have that common interest, you could be interested for a while at least in what the view is from where I sit.

I chose the title of this talk for the deliberate purpose of being provocative. I would place a small bet that none of you has thought of groundwood before as both the oldest and the newest of wood pulps. You probably think of it primarily as the particular type of wood pulp you are working with, and let it go at that. I want to provoke you into seeing it as I do, because the stability of age coupled with the excitement of newness is a rare thing, and where it does exist, an extremely pleasant one. If we who rely on groundwood for our jobs are in that type of situation, let us realize it so that we can get the most possible pleasure out of doing what we are going to do anyway.

I have heard that soda pulp antedated groundwood in commercial use in this country, and I have also heard that it didn't. Which is right I don't know, nor does it make much difference. Perhaps my title is a bit more provocative than accurate in the modern history of the industry. But the first true paper made nearly 2,000 years ago was made of cellulose fibre which came from wood from mulberry and bamboo trees. I think we can rest assured that that long ago the process was mechanical, not chemical. So technically at least, or perhaps by a quibble, my title is accurate despite the modern race for priority between soda and groundwood pulps.

ROBERT E. CANFIELD

Groundwood started out as the answer to a prayer. In the middle 19th century, the world badly needed more paper making fibre, preferably cheaper, but more in any event. The only then known source of suitable fibre was from rags, and the demand for rags had become so intense that there was even a lively market for the wrappings of Egyptian mummies for paper making fibre. When demand gets so frantic that grave snatching becomes a respectable business practice, you really have a shortage. The introduction of wood as a fibre source ended all of this and made possible the modern history of the paper industry.

Groundwood was in on the ground floor, providing more fibre and cheaper fibre. As usual, however, the ground floor did not stay unpopulated for long. The chemical processes subsequently introduced, produced pulps and papers of higher quality and appearance than groundwood. They added to the supply of paper making fibre and although more expensive than groundwood, were still cheaper than rag fibre. On the face of it, one would have thought it probable that chemical pulps would drive both rag and groundwood pulp completely out of the market. They did nothing of the sort. Both stayed very much alive, but at opposite ends of the scale. Rag pulp became the pulp for top quality where permanence was desirable, rather than the only pulp for all grades. Groundwood became the basic pulp for those grades where lowest cost was the major criterion, specifically newsprint. The chemical pulps took over the field in between.

Of course it took a great many years for this alignment to become definite. But once the relative positions of the various types of pulp had become established in the market, one might well have assumed that it was a permanent relationship. But one would have been wrong. Having been pushed down to the bottom of the quality ladder but not off it, groundwood started back up again. It started up not so much because of cost factors but because of certain inherent desirable qualities which it possessed and other pulps did not. Gradually over a period of years but ultimately almost completely, groundwood superseded other pulps in the production of hanging paper and catalog and directory papers. During the same period of time groundwood papers such as poster and railroad, where cost was perhaps more important than the other qualities of groundwood pulp, developed, as did uses in other types of paper and board where economy was of primary importance.

Groundwood obviously had a place, proven in the fire of competition over more than half a century, which was secure despite technological developments which produced papers that groundwood pulp couldn't match. Groundwood could grow with the growth of the business which depended upon its particular virtues. It did, but so far as its major use was concerned, it didn't do it in this country. In 1913 Congress fixed that. In making newsprint duty free, it stopped what would have been normal growth of the U. S. industry with the growth of the newspaper business and assured that growth to Canada. It would have appeared at that time reasonable to suppose that the groundwood paper industry in the United States was doomed to at least relative stagnation, but like the other reasonable assumptions I have mentioned, this one also turned out to be wrong. Deprived of what might well have been expected to be its biggest influence for growth, the industry has grown anyway. It has grown not so much where it had a virtual monopoly because of cost, but where there was the most violent possible competition, where cost factors alone could not possibly have accomplished the result, and in the face of extreme and unreasoned prejudices. The particular qualities of groundwood pulp made this possible. Instead of going out of business or stagnating at the pre-World War I level, groundwood has grown and progressed, and at the end of three-quarters of a century was stronger than ever before.

Three-quarters of a century in this particular era of the world's history is

An address delivered at the TAPPI Mechanical Pulping Conference, Poland Spring House, Poland Spring, Maine, September 28, 1948.

a long time. Economically it is the equivalent of centuries in an earlier time. Anything which has healthily survived it is pretty well asured of continued health. So I feel that the groundwood paper industry has the stability of age, and that we are extremely fortunate in that. Groundwood is here to stay. If nothing more, we can count on continued business at the ground floor level. Actually the past indicates quite clearly that we can count on that business plus quite a bit.

So much for groundwood as the oldest pulp.

Why call it the newest? What's exciting about its prospects? Let's take a look.

As I have pointed out, groundwood papers have developed far beyond the basic demand predicated on economy, and this has happened because of the peculiar characteristics of groundwood paper. Groundwood paper inherently possesses printability not matched by papers made with other pulps. Printability is of course a complex concept. It is the result of a dozen or more different factors among which are cushion, flexibility, formation, uniformity, affinity for ink, opacity and the like. You can add to the list and weight them to suit yourself, and a groundwood paper salesman will do even better at it. For the purpose of this talk, let us just lump them all together and call it printability. Groundwood pulp originally had, and still has to a lesser extent, certain negative aspects. It is not as strong, nor as bright, nor as permanent, nor as clean as paper made from some other pulps. Those basically were the pluses and the minuses which existed when groundwood, having hit the bottom of the ladder, started up. In the case of hanging paper, the pluses such as its ability to take coating and multi-colored printing, and its flexibility, made it highly desirable. The pluses far out-weighed the minuses. In the case of catalog and directory papers where light weight is an essential use factor, the opacity of groundwood paper at any given ream weight compared with chemical pulp papers is of utmost importance.

When anything has admitted positive characteristics and admitted negative ones, the obvious thing for anyone concerned in their manufacture and sale to do is to accentuate the positive and minimize the negative. When mills in the U. S. went off of newsprint because they had to then, or saw the future handwriting on the wall, it was possible, indeed essential, to start this process. Experiment, trial and error, research and the willingness to spend capital funds by you people and your predecessors, has substantially eliminated one of the negative factors. The use of peeled wood, selected wood, better screens, better stones, the cleaning up of wood rooms and mills, the use of finer wires and machine cloth-

ing and a host of other detailed improvements in mills has resulted in finer quality and cleaner groundwood pulp which in turn made possible the production of groundwood papers at a quality level undreamed of when newsprint was for all practical purposes the only major use for groundwood pulp.

This development spread over many years and still going on, marks the start of groundwood as the newest wood pulp. It is still called groundwood, and it still is groundwood, but it is new and different, and the qualities of paper made from it prove that fact.

As recently as 4 or 5 years ago, the Groundwood Association was seriously considering spending many thousands of dollars in a publicity campaign to combat the prejudice which existed against groundwood paper. We haven't discussed it lately and I doubt if we shall for the prejudice has largely disappeared. Compared with even a few years ago, the acceptance of groundwood content papers in the market is phenomenal, and it is the change from newsprint grade groundwood, or just plain groundwood as it used to be known, to present day qualities of groundwood that made result possible.

While this has been going on, there has been no comparable improvement in other pulps except the perfection of multi-tage bleaching of sulphate pulps. Perhaps as to newness, groundwood and bleached sulphate have been run-

(Continued on page 19)

NEW FORT SMITH, ARK., PLANT HOLDS OPEN HOUSE

CECIL F. DAWSON, president of the Dixie Cup Co., was host at a Family Day open house at the firm's new plant in Fort Smith, Ark., on October 5, when several thousand guests made a tour of inspection of the recently completed unit. . . The plant is of structural steel and brick construction. It is a one-story building 320 feet wide by 360 feet long, with floor space of 122,000 square feet. . . A color scheme following the Color dynamics principle provides a very pleasing effect. Walls are painted a cool green, with some walls a dusky rose to add interest and provide a pleasing contrast. Ceilings are painted a light cream to add warmth, and operating machinery is colored to aid visibility of moving parts. All pipes and conduits are painted in bright colors, and are color-coded for easy identification. . . The building is well insulated and has heat and glare-resisting glass installed throughout. Automatic sprinklers, fluorescent lights, unit heaters in the manufacturing area and by finned pipe coils below the windows in the offices, attractive and clean locker rooms tile walls and terrazzo floors and ample washing facilities are features. . . Architects were Haralson & Mott of Fort Smith; general contractor, Ditmar-Dickmann-Pickens Construction Co.

Oldest and Newest

(Continued from page 18)

ning a tie race. The tie, however, has been broken recently with the introduction of highly bleached groundwood. The history and techniques of that process you have been hearing about in papers delivered earlier today. It is the development which thoroughly justifies the second part of the title of this talk. It is the newest thing in paper making. The high grade, high quality, high brightness bleached groundwood pulps available today bear as little resemblance to the original news grade of groundwood as Cro-Magnon man bears to his present day successor on earth. They are both recognizable as of the same family, and that's about all.

The effective use of bleached groundwood pulp in printing paper is just starting. It is difficult to believe that its perfection will not create an upheaval among wood pulp papers of the same order as that created among papers generally by the introduction of wood pulp. It eliminates the basic important minus in the balance scale between groundwood and chemical pulps. It should go far to eliminate what little is left of prejudice against groundwood pulp which has existed for so many years.

The bleaching of groundwood of course costs money and as such cuts down somewhat the economic advantage enjoyed by groundwood. But the development of groundwood above the newsprint quality level has never depended as much on cost saving as on quality factors. And it seems to me almost unarguable that the improvement in quality caused by the availability of bleached groundwood pulp far outweighs any possible economic detriment resulting from the higher cost of using such pulp. Full utilization of the bleaching process should permit groundwood paper to be used freely throughout the printing field with the determining factor of whether groundwood or chemical pulp papers are to be used, resting not upon appearance but upon printability. If I am correct in this assumption there is no room for doubt as to the growing importance of groundwood. It was noted several years ago by your Secretary in a speech he made about groundwood which he then referred to as the "Cinderella" pulp. He pointed out that as unbiased an agency as the Government Printing Office had come to the conclusion that all other things being equal, the most desirable printing paper would be one composed wholly of groundwood pulp.

This conclusion of the Government Printing Office raises a question of the only other important minus factor: groundwood strength. As it stands, we cannot produce a satisfactory sheet made wholly from groundwood, because it is not strong enough. While you people, you technicians and practical mill operators, are going rapidly ahead with bleached groundwood pulp as you will be doing during the future years, you might also keep in mind the fact that the lack of strength in groundwood pulp is not inherent in the fibre itself. The cellulose fibre in any given stick of wood is the same whether the pulp produced from the wood is kraft, sulphite, soda or groundwood. It is the process of grinding the wood presently used which makes a weaker pulp. I do not think I over-rate the ingenuity of the technical people in the industry when I say that I believe that the process can be modified successfully to produce stronger fibre. I have been told that it could not be done without eliminating some of the desirable attributes of groundwood. This then is your challenge: to produce the ideal printing sheet. It is up to you people to find out how groundwood pulp can be produced without weakening the basic strength of the fibre as much as it now is and without eliminating or reducing the desirable characteristics of groundwood pulp. That, I think, is the next step toward keeping groundwood the newest wood pulp.

Once that is accomplished, there is only one basic improvement to be desired. That has to do with fastness to light. It is relatively unimportant since the great bulk of printed material is not intended for permanent records in any event. Furthermore, the bleaching of groundwood substantially improves the permanence characteristics of groundwood paper. But elimination of the so-called fading of groundwood, while not vital, would certainly be desirable. Perhaps knowing little, I have to much faith in the ingenuity of scientists, but I cannot believe that the job cannot be done. The studies of groundwood fading made by the Institute of Paper Chemistry on behalf of the Groundwood Association, while they have not even started to solve the problem, in my uneducated judgment support the belief that the problem can be solved.

That perhaps would be the ultimate step in keeping groundwood the newest of wood pulps. When that is accomplished groundwood could rely for its acceptance upon its quality advantages rather than upon its economic advantages. One might think that with the minus factors removed, the plus factors still inherent in the pulp and an inherent economic advantage over other pulp, groundwood could virtually eliminate chemical pulps. This I think probably is as unwarranted an assumption as others I have noted in sketching the history of groundwood. It seems possible at least to me that your fellow technical men, more interested in chemical pulps than you are, may in the course of their researches bring groundwood and chemical pulps to at least a dollar and cents cost balance with each other. They may go much further. For a great many years producers of chemical pulps have thrown away half of the volume of wood they used. It is not at all unlikely that chemical research will ultimately demonstrate that that fraction heretofore thrown away, is at least as valuable as the fibrous half of the wood which has been retained. One chemist friend of mine many years ago told me that he firmly expected to live to see the day when sulphite pulp was a by-product of a process the primary purpose of which was the creation of synthetics from the parts of the wood which are not cellulose fibre. He didn't live to see the day, but his children or grandchildren may.

If this situation develops, the dollar and cents advantage of groundwood will have evaporated. It will then be a very good thing for those of us who wish to dine at the groundwood table if the problems of strength and permanence of groundwood have been solved so that its use can be determined by its merits alone rather than by a balancing of merits, demerits and costs. I do not know how far the technical men have gotten with the problem of sulphite waste utilization. It may possibly be later than we think in this race between chemical and groundwood pulps.

In the last analysis, I think that the oldest recognized feature of groundwood may well ultimately become its strongest point, and that is its economic advantage over chemical pulp, not in the sense of dollar cost but in the sense of wood cost. The wood supply of the world is not inexhaustible as every one once thought, and as demand for paper increases throughout the world, the controlling factor as to what pulp shall be used may well become the question of what pulp uses the least wood. While I can visualize easily groundwood pulp eliminating its disadvantages and forging ahead of chemical pulp, and then chemical pulp eliminating its monetary disadvantage by utilization of that part of the wood which is now thrown away, I cannot visualize anything which can affect the inherent permanent advantage of groundwood from the point of view of wood economy. If we ever get to the day when pulp use is dependent on that factor, groundwood, although it may not then properly be characterizable as the newest pulp, will certainly still be going strong.

I do not know whether you got into the groundwood business as I did accidentally, but I suspect most of you did. Almost everybody seems to get into whatever they are doing largely through accident. I do not know what you think, but I think it a fortunate accident. I like the prospects. I feel comfortable with the stability of the business that has been demonstrated through so many years and I feel excited about the prospects of the future based on the new things that have recently happened to groundwood and that you people and your successors are going to make happen to groundwood in the future.

Future Pulpwood for Wisconsin Mills

By M. N. TAYLOR
Executive Director, Trees for Tomorrow, Inc.

Papermaking ranks as Wisconsin's third industry and the nation's sixth industry. Still, throughout the country, this industry uses only ten percent of the timber consumed, the remaining 90 percent being used for other purposes.

As superintendents of mills in a great paper producing section of the country, you are charged with the responsibility of maintaining an uninterrupted flow of paper products made from the raw material—wood. For this reason it is only natural to feel that you are concerned with the establishment of a permanent and local supply of this raw material. . . .

Forestry today, is the strongest single influence in determining northern Wisconsin's economic development.

Trees for Tomorrow—Origin

It might be practical to explain what Trees for Tomorrow is and what its program envisages.

Its program is the laying down of a pattern whereby ten paper mills can help grow more trees and project good forestry to small woodlot owners, schools, and entire communities.

The Trees for Tomorrow organization was founded in February, 1944, as a non-profit organization of the Wisconsin Valley papermaking industry with Folke Becker of the Rhinelander Paper Co. as president. Other officers are: E. B. Hurst of the Consolidated Water Power & Paper Co. and C. G. McLaren of the National Container Corp. of Wisconsin, vice-presidents; D. B. Smith of the Ward Paper Co., secretary-treasurer, and M. N. Taylor, executive director. Member mills in addition to the four mentioned above are: Whiting Plover Paper Co., Mosinee Paper Mills, Marathon Corp., Wausau Paper Mills, Tomahawk Pulp Co., and Flambeau Paper Co.

In 1870, Wisconsin was covered with 20 million acres of virgin conifers and hardwoods. In 1944, the State Conservation Department reported there remained only 44 thousand acres of virgin timber. Something of an economic paradox exists at the present time.

The papermaking industry in the Wisconsin River Valley, one of the most concentrated papermaking regions of Wisconsin, represents investments of more than 100 million dollars in plant equipment. At its height, the lumbering industry had no such investments. Still, the raw material, wood, from which paper is made, is obtained only in small amounts within the boundaries of the state.

A line on a map traces the course of the Wisconsin River from Otter Rapids through north central Wisconsin in Wood county. Along its course are 22 reservoirs and 23 power dams, representing a producing investment by private capital of millions of dollars.

Through this system of reservoirs, the Wisconsin River at the present time supplies two of the three natural resources essential to papermaking—power and clear water.

The third natural resource, trees, can and should be grown at home.

Papermaking in most of these communities is the heartbeat of industry. . . . In some of them, 73 percent of industrial employes are paper mill workers.

Paper mills in this region spend annually ten million dollars for pulpwood, 80 percent of which comes from outside Wisconsin. Visualize how the cash spent to harvest this crop in Wisconsin would bolster the economic structure of the northern section of the state.

The paper mill payroll is the largest on the Wisconsin River, and papermaking contributes the largest amount to the state and counties in taxes.

The present economic paradox is further pointed up by the following: Within the confines of 26 northern Wisconsin counties are ten million acres of land which are suited only for forests and for recreational purposes.

Certainly the job ahead is big, but so are the benefits that can accrue to all of the state. Of prime importance is the fact that this region can supply Wisconsin's third industry with an annual 30 million dollar crop of home grown pulpwood.

There are four factors that make a large-scale, long-range forestry program practical. They are:

(1) Forest zoning. This zoning prohibits the starting of farms on land not suitable for agriculture; (2) Forest fire protection. Wisconsin now ranks at the top of the nation in forest fire protection; (3) The large forestry programs now under way by Federal, State, and other agencies, and the industrial forestry programs of industry; (4) Last, but not least, a growing consciousness on the part of the small land owner, who owns 57 percent of the commercial forest land in the state, that timber can be harvested as a crop.

How can private industry help to build this new "Green Frontier" for tomorrow?

The Job Ahead

Three and one-half years of research in the field have proved that industry as a unit, without duplicating what is being done, can afford to invest time, money, and effort as a semi-public organization in forestry.

There are 17 million acres of forest land in Wisconsin with a total of 4½ million unproductive acres. The job ahead will require education and selling to induce private landowners, who own the greatest share of this acreage, to do their part. This can best be accomplished through co-operative effort.

Because of the long range aspects of forestry, Trees for Tomorrow realizes that it is only common sense to being by capturing the enthusiasm and by directing the thinking of boys and girls in school today so that they will be in an informed position to manage our natural resources tomorrow. Before students can be interested, it is necessary to interest school officials and faculty members. This is accomplished through field institutes in the summer and conservation seminars in the winter. As a result, accredited forestry conservation classes are now a part of the curriculum of a number of Valley schools.

School forests function in the same way as does the laboratory in a chemistry class in carrying out a class room program. These forests are mapped by students with the help of a Trees for Tomorrow forester who lays out a program for their full development. As many as 40,000 trees have been planted on a single school forest in one season.

Forestry Scholarships

Five senior students from the 29 schools in the Valley are eligible each year to receive $2,500 in Trees for Tomorrow scholarship awards. Scholarship winners have entered the University of Minnesota, Michigan State College, University of Michigan, Syracuse University and a number are considering the University of Wisconsin and certain other state colleges.

Memorial Forests

Memorial forests provide a means whereby all of the people can play a role in rebuilding the natural resources of the region. The largest in the region is one of 11,000 acres in Oneida County.

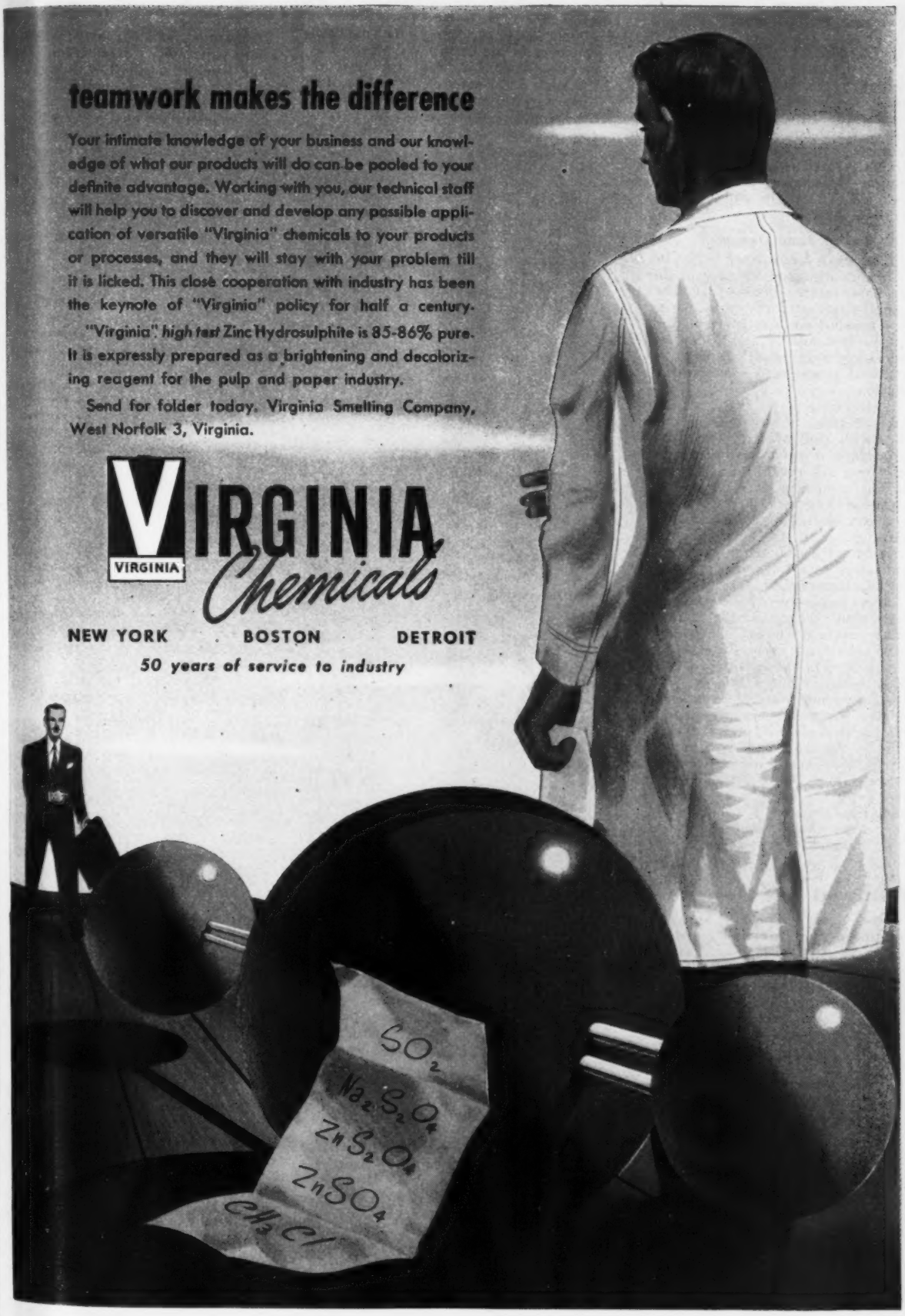
Conservation Camp

During the summer, Trees for Tomorrow operates a camp at Eagle River in co-operation with the U. S. Forest Service. During the past six months, citizens, both young and old, of 67 Wisconsin counties and 42 states throughout the nation, have attended sessions.

Groups represented included a five-week summer school sponsored by nine State Teachers Colleges, boys and girls from 4-H Clubs, a class from the University of Wisconsin, periods spon-

(Continued on page 22)

Excerpted from an address delivered at the Fall Convention of the Northwestern Division of the American Pulp & Paper Mill Superintendents Ass'n., Merrill, Wis., September 24, 1948.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Your intimate knowledge of your business and our knowledge of what our products will do can be pooled to your definite advantage. Working with you, our technical staff will help you to discover and develop any possible application of versatile "Virginia" chemicals to your products or processes, and they will stay with your problem till it is licked. This close cooperation with industry has been the keynote of "Virginia" policy for half a century.
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ZnSO4
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Future Pulpwood

(Continued from page 20)

sored by the Milwaukee Public Museum, the Milwaukee Conservation Alliance, the Institute of Paper Chemistry, Wisconsin Valley high schools, Future Farmers of America, and intraining sessions of the State Conservation Department and U. S. Forest Service. The camp will continue operation until Nov. 1.

Land Owners

The small land owner holds the key to projecting good forestry in the immediate future. Because of the very peculiarities of forestry by which every woodlot poses a different problem, on-the-spot advice and follow-up are necessary to bring all phases of a well-rounded program to a successful conclusion.

Reforestation is featured prominently because it provides initial contact with land owners. The following procedure is used in the distribution of trees: All requests are screened as to soil, conditions, type of ground preparation to be used, planting standards, and the species of trees available for planting. The trees are distributed throughout each county at a set time and place and following a tree-planting demonstration.

It is the purpose of the tree distribution plan to get seedlings into the hands of land owners who would not otherwise order trees through regular channels. The minimum order is for 500; the maximum 5,000.

Another important observation is the interest shown by absentee land owners, individuals who are not farmers.

It is the immediate purpose of the program to maintain interest in reforestation until 80 to 100 million trees are available each year from state nurseries. Planting 100 million trees a year will cut the required time to reforest unproductive acres from 125 years to 25 years.

Multiwall Men Meet

NEW YORK — The first annual sales meeting of the Multiwall Bag Division of the St. Regis Sales Corp., subsidiary of St. Regis Paper Co., held in the Hotel Waldorf-Astoria September 23-24, brought together sales personnel of this division of the company from all sections of the country.

Arch Carswell conducted the meeting. Actively participating were the five district sales managers of the division, V. C. Douglas, Burton A. Ford, J. F. Gruber, George P. Haberstein, Hugh W. Sloan and their entire sales' staff.

E. R. Gay, vice-president of St. Regis Paper Co. and director of the company's Packaging Division, and Robert P. Bushman, vice-president of the company's sales corporation, who heads the Engineering and Machine Division which designs and builds automatic filling equipment, also participated.

100 Awarded Service Pins

OREGON CITY, Ore.—One hundred employes of the Crown Willamette Paper Co., West Linn mill assembled in the West Linn hotel on Sept. 17 to receive service pins for service to the firm from five to 45 years. P. T. Sinclair, resident manager of the mill, himself a recipient of a 20-year pin, presided at the gathering.

Feature of the program was the awarding of a 40-year pin to John N. Mulkey, San Francisco, comptroller for the Crown Zellerbach Corp., who came "home" to West Linn, where he first started work with the company, for the affair.

Presentation of the pins was made by J. E. Hanny, vice-president of the Crown Zellerbach Corp. Guests were present from nearly all divisions of the corporation in the Northwest.

Service pins went to the following employees:

45 years—Alvin A. Rittenhouse.

40 years—Joe Benski, John Gengler, John N. Mulkey, J. A. Rayl and James E. Simpson.

35 years — Erik Hedlund, Fred Kerbs, Albert Meilike, Edgar G. Roth, Clay G. Warren and Walter Wood.

30 years—George W. Beam, Charles M. Gleason, George E. Hale, Ted Lilly, William S. Moriarity, James M. McLennan, Stanley Reddaway, Roland C. Rieman, Clifford E. Teeple and Otto Toedtemeier.

25 years—Lewis H. Cameron, Henry A. Courand, Alfred B. Curl, Joe Gerkman, E. J. Haas, Herman Hansen, Gordon Hammerle, Rene E. Honorat, Milo Ingram, Henry Kerbs, Albert N. Lilly, John Niebauer, Clifford Robins, Frank Schmitz, Ralph Shivers, John Silver and Alton Stalick.

20 years—Millard H. Baker, Theodore T. Bauer, Henry Dambach, Sam J. Danill, Joe Davis, Frank B. Hale, Bert E. Hopwood, Harold C. Johnson, August W. Kloer, Clarence Lundgren, Manford M. Manning, Clarence McGahuey, Peter T. Sinclair, Charles Stone, Roy Tiedtke and Rutherford A. Wilkinson.

15 years—William D. Anderson, LeRoy Allen, Will J. Aschenbrenner, Charles A. Bancke, Grant A. Day, Leo H. Hall, Gilbert H. Hanson, Reed M. Ingalls, Edward S. Karbonski, George LaHusen, Irvin J. Lavier, Florentine M. Mighells, Henry F. Planton, Louis J. Planton, Jr., Lonic Schaber, George W. Smith, William A. Smith, Harry J. Staben, A. N. Steichen, Arthur W. Van Domelen, Ernest E. Wallis, Milton N. White, Marion C. Wickstrom and John Zimmerman.

10 years—Helen E. Brown, Arthus L. Hassell and Robert A. McNulty.

Five years—Harold U. Brawner, Ralph W. Cook, Oscar E. Chandler, Larry A. Gary, Laverne L. Hoffman, Robert F. Mathers, Mary Lou McCormick, Bessie Pesek, Manuel R. Parra, Frank Pesek, Esther E. Richter, William A. Rose, Betty I. Russell, Thelma H. Staben, Avis G. Stapper, Christina Taylor, Henry Witherspoon and Elizabest Widmer.

Canadian Mills Prosper

TORONTO — Canadian manufacturers of fine papers are presently enjoying a high level of business with pospects that there will be no easing of this favorable situation for a year, at least.

The industry enjoyed a record year in 1947 and present indications are that last year's records will be exceeded this year. Production has continued at an all-time high level while demand has been sufficient to absorb all the additional output.

Supplies of raw materials are generally satisfactory throughout the industry although shortages do still exist here and there. Special items such as certain dyestuffs, chemicals and pigments are not always immediately available when required. Delayed deliveries on these items have tended to retard the varieties of products from some plants. Production costs have increased in this industry as in all others and workers in the industry received a substantial increase in wage rates in May last. Two fine paper price increases were necessary to take care of these increased costs.

The chief impediment to expansion in the industry at present is the dollar shortage in countries importing fine papers from Canada. Export business is hampered with such countries as West Indies, Australia and India, where import orders have had to be cut to the bone to conserve dollars. Such restrictions, however, have not as yet had much affect on Canadian fine paper production schedules.

Maine Paper Education

ORONO, Maine—Officials of paper making concerns in Maine and from out-of-state points are scheduled to give 15 weekly lectures at the University of Maine on Pulp Technology. The course is a requirement of the pulp and paper division of the chemical engineering department at the university, in which about 25 students are enrolled. Professor Lyle C. Jenness, head of the department of chemical engineering, reports executives "extremely cooperative" in making the series possible.

John Lewis, of Skowhegan, has been named instructor for the course. He will work under the direct supervision of Professor Jenness in carrying on the recitation and examination work in connection with the program.

In addition to the speakers, other representatives of paper manufacturing concerns have been invited to attend the lectures and take part in the discussions.

Robert Nivison, Jr., assistant to the vice-president of the Hollingsworth & Whitney Co., spoke on "Mechanical Pulping" and October 6.

In previous lectures Professor Fay Hyland, of the University of Maine, spoke on "Chemical Properties of Pulp Wood," and C. A. Redden, chief engineer of Hollingsworth & Whitney on "Preparation of Pulp Wood."

UNIFORMITY

STEP-BY-STEP CONTROL in the process of manufacture assures a high degree of uniformity in Wyandotte Precipitated Calcium Carbonate.

But that's only part of the story. Wyandotte Precipitated Calcium Carbonate is a highly refined chemical, free from any form of grit or abrasiveness. As a paper-coating pigment, it provides high whiteness and smoothness to the coated sheet. It is unsurpassed in hiding power and ink absorption.

If quality coating is a consideration in your plans, you'll find that Wyandotte Precipitated Calcium Carbonate will meet your most exacting requirements. Complete information will be furnished at your request.

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Soda Ash • Caustic Soda • Bicarbonate of Soda • Calcium Carbonate • Calcium Chloride • Chlorine • Hydrogen • Dry Ice • Synthetic Detergents
Glycols • Ethylene Dichloride • Propylene Dichloride • Chloroethers • Aromatic Sulfonic Acid Derivatives • Other Organic and Inorganic Chemicals

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Blank Book Conference

HOLYOKE, Mass.—The Eastern Division sales conference of the National Blank Book Co. was held here September 22-24.

The salesmen made an inspection trip through the local plant before the conferences got under way.

Executives taking part in the conference were Joseph M. Towne, president; Richard P. Towne, treasurer; Paul B. Buckwalter, sales manager; Richard M. Weiser, manufacturing manager; Albert E. Farr, merchandising manager; Albert L. Gibney, sales promotion manager; Daniel C. Hegarty, advertising manager; Herbert Burton, Leroy W. Kirchner, and Francis Fleming, all assistant merchandise managers; Clayton R. Harvey, production analyst; Alton B. Hughes, assistant treasurer, and Harris M. Tanner, traffic manager.

The following salesmen attended: Sam Orr, Atlanta, Ga.; Walter O'Brien, Rector, Pa.; George Harscheid, Philadelphia, Pa.; Frank Horner, East Orange, N.J.; Otto Drescher, Nutley, N. J.; H. J. Ferry, Longmeadow, Mass.; J. Sidney Croke, South Hadley, Mass.; Ray Fletcher, Boston, Mass.; William Lindenberger, Hempstead, Long Island, N.Y.; George Nicklaus, Richmond Hill, N.Y.; Alfred Quinn, Brooklyn, N.Y.; Lester Weber, Brooklyn, N.Y.; Robert Wall, Port Washington, Long Island, N.Y.; and Howard Brigham, New York City.

Forest Fire Peril

TORONTO—Forestry officials in the Blind River-Sault Ste. Marie district of Northern Ontario early last week began an all-out recruiting drive for firefighters as the big Grassett township forest fire spread at an alarming rate throughout 725 acres.

Fanned by a strong northwest wind, the fire jumped from 250 acres to the big 750-acre mark and gave indications that it might spread well over 1,000 acres within a few hours.

The fire took its biggest jump when it leaped across three bodies of water to dig into rich timberland. As many as 15 fires were being fought by the middle of the week and the hazard was increasing hourly. However, light showers the nights of September 30 and October 1 put a damper on the fires when about a quarter of an inch of rain fell. More rain was forecast for the district over the week-end.

St. Regis Shifts Three

NEW YORK—Fred C. Goodwill has been named resident manager of the Kalamazoo mill of the St. Regis Paper Co. John H. Heuer will succeed Mr. Goodwill as technical director of the Central Laboratory of the company at Deferiet, N. Y. Peter J. Massey, hitherto resident manager of the company's Kalamazoo mill, has been appointed chairman of the company's New Products Development Committee and will have his headquarters in New York City.

AN INVITATION
to
Technical Writers

Paper Trade Journal in the Industrial Development Section, makes space available for discussion of administrative and operating problems. Space is also available for presentation of independent studies and research on technical and engineering subjects. Feature stories of paper mills, converting plants and interrelated industries will also be included.

An invitation is cordially extended to all who are qualified to discuss these subjects.

Original manuscripts submitted exclusively to Paper Trade Journal and found suitable for use in this section will be paid for immediately upon acceptance. Submit manuscripts to E. P. McGinn, Industrial Editor.

Ground-Breaking Ceremony

SACRAMENTO, Calif. — Company executives and civic officials attended a ground-breaking ceremony at the site of the new distributing plant of the Zellerbach Paper Co., at Richards boulevard and North Twelfth street in the Sacramento Industrial Park on September 24.

Speakers included Leland J. Doherty, manager of the Sacramento division; H. L. Zellerbach, president of the firm; E. A. Brayman, vice-president in charge of construction; and King Wilkin, vice-president and general sales manager; and William J. Zellerbach, assistant to the general sales manager, all of San Francisco.

The plant will be a concrete and steel structure covering approximately 170,000 square feet of floor space. It will serve Northern California and most of Nevada.

The complete operations of the Sacramento division wil be moved there from 1213 Front street as soon as the building is completed, probably early next Spring.

Purchase Plan Scuttled

NORTHAMPTON, Mass.—Advised that the Bagley & Sewell Co., of Watertown, N. Y., wants $100,000 for the former Norwood Engineering Co., in Florence, manufacturer of paper-making machinery, exclusive of machinery, the Chamber of Commerce directors decided on September 23 not to proceed with their plan to have the plant purchased with local money.

Gets Florida Tract

SAVANNAH, Ga.—The Union Bag & Paper Co. has acquired a 99-year lease on a 70,000 acre tract of timber land in the Lake George sector of Florida, owned and operated by M. F. Brice, Vidalia capitalist and his associate, O. L. Brice of Gainesville, Fla.

"Best of Industry"

PHILADELPHIA—Elmer S. Lipsett, sales promotion executive of the S. D. Warren Co., Boston, was one of the judges of the Best of Industry direct mail awards made at the 31st annual conference of the Direct Mail Advertising Ass'n., at the Benjamin Franklin Hotel on September 29.

Paper manufacturers receiving a Best of Industry awards in their respective classifications were the Champion Paper & Fibre Co., Hamilton, Ohio, of which F. C. Gerhart is advertising manager, and Mohawk Paper Mills, Inc., Cohoes, N. Y., of which George M. Robinson is advertising manager. The Tension Envelope Corp., Kansas City, Mo., of which Martin Baier is advertising manager, received a similar award as a converter.

Bonus Distributed

SPRINGFIELD, Mass. — The regular five percent bonus to employes of the U. S. Envelope Co., was distributed on September 27, to an estimated 1,000 workers in this city. The bonus, which has been paid for a number of years, is calculated on earnings of employes during a six-month period, and is predicted on profits of sufficient volume to warrant profit-sharing with the employes. President Eldon V. Johnson, in reporting the bonus, said the payment was based on the company's earnings for the first six months of this year.

Thomas Succeeds Barea

LEE, Mass.—Arthur A. Barea, who resigned on September 27 as superintendent of the Columbia machine room of Smith Paper, Inc., has been succeeded by William P. Thomas in that post. Mr. Barea, who began working for Smith Paper in 1928, will take a position at the Rowland Paper Mill in Canada. Mr. Thomas, who formerly was assistant day superintendent of the Eagle machine room, came to work for the Smith company in 1919.

Westminster Tax Cut

NEW WESTMINSTER, B. C. — The Westminster Paper Co., Ltd., recently had its business tax reduced $2,000 by the court of revision here. Original assessment of the plant had been placed at $85,000 and the business tax at $8,500. The bill was reduced to $6,500 without prejudice to future assessment.

Milton October Forum

NEW YORK—Charles B. Konselman, advertising and public relations manager of A. & M. Karagheusian, Inc., and president of the Direct Mail Advertising Ass'n., Inc., will address the Milton Sales Forum, sponsored by the Milton Paper Co. at the Masonic Club on October 15.

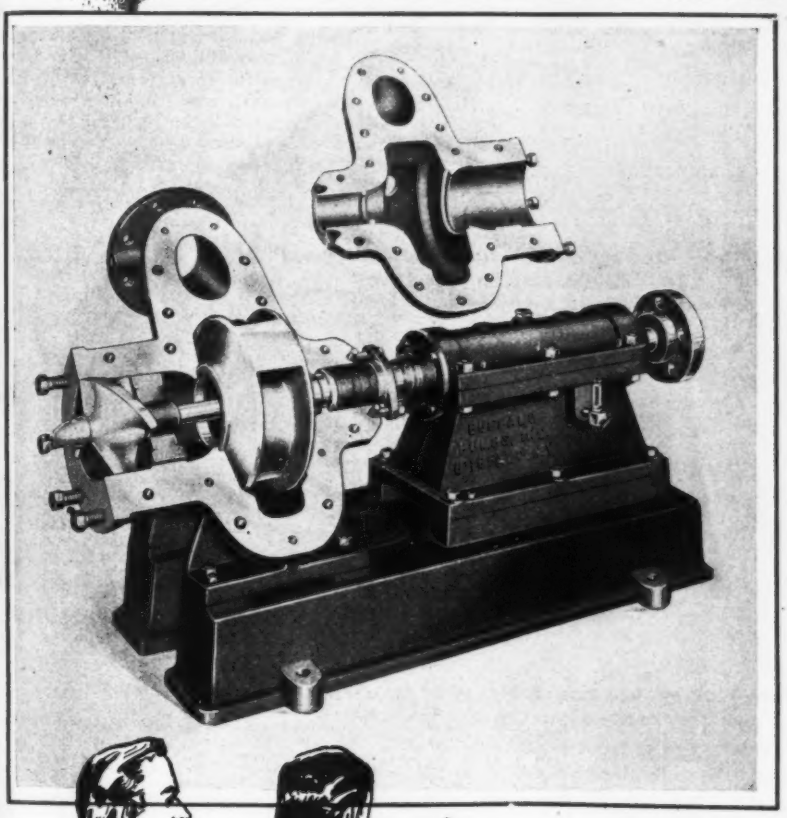
Miller Succeeds Caldwell

CINCINNATI—Robert H. Miller has been named sales manager of the fine paper division of the Chatfield Paper Corp., succeeding Wm. J. Caldwell, who died on September 21.

CENTRIFUGAL PUMPS FOR EVERY SERVICE

"Efficient, Durable Non Clogging AND SIMPLE TO INSPECT!"

PUMPS by "Buffalo"



"Buffalo" DIAGONALLY SPLIT-SHELL PAPER STOCK PUMPS

Just pull a few flange and casing bolts, and you expose all pump parts! It's this ACCESSIBILITY that makes maintenance of "Buffalo" Type "DS" Pumps so simple and economical. And this "look inside" shows you how sturdily built this pump is. It's just one of many "Buffalo" Paper Stock Pumps to make your job easier, and to cut your costs . . . all described in Bulletin 953-F, at left. *Write for your copy!*

For

- WATER ANY TEMPERATURE
- PAPER STOCKS (NON-CLOGGING)
- GENERAL SERVICE
- ACIDS
- ALKALIS
- SLURRY
- CONDENSATE RETURN
- SUMP CLEARANCE
- FIRE SERVICE
- SEWAGE
- SELF-PRIMING SERVICE

BUFFALO PUMPS, INC.

159 MORTIMER STREET BUFFALO, N. Y.

Canada Pumps Ltd., Kitchener, Ont.

RUGGED, PRECISION CONSTRUCTION—FOR LONG LIFE

Kenmore Mills Action

PROVIDENCE, Md.—"The machinery, power plant, equipment, etc., piece by piece and in units and groups, as well as part of the entirety" of the Kenmore Mills of the Jessup & Moore Paper Co., are scheduled to be auctioned on or about October 28 by the Asset Realization Co., 790 Broad street, Newark, N. J.

Peetz Succeeds Polson

HOLYOKE, Mass.—Gordon R. Polson, 70, who has worked in every department of the Valley Paper Co., retired on September 30 as superintendent of the company where he has worked 53 years. He has been succeeded by Walter E. Peetz, who has been assistant superintendent at the company for 14 years.

Conservation Broadcasts

WASHINGTON—In cooperation with the New York City Board of Education, the Forest Service, U. S. Department of Agriculture, has begun production of six conservation radio dramas entitled "Bill Scott—Forest Ranger" which early this school year will be made available in the form of transcriptions for use by other local stations and in high schools and class rooms throughout the country.

Addresses Office Managers

RALEIGH, N. C.—Wm. O. Smith, treasurer of Edwars, Broughton & Co., discussed paper and its relation to business in a talk before the local chapter of the National Office Management Ass'n. recently.

Jackson Named V.P.

VANCOUVER, B. C.—Thomas B. Jackson, vice-president of Pacific Mills, Ltd., and general manager of Northern Pulpwood, Ltd., has been elected vice-president of the B. C. branch of the Canadian Forestry Ass'n., succeeding J. D. Gilmore, who has returned to Toronto to establish a private practice as a forest engineer.

New Model Vapocan

CHICAGO—Container Corp. of America is in production on a new model Vapocan all-purpose frozen food container for lockers and home freezers. Principal new features are tapered sides, a full top opening and a permanent plastic lid which can be used year after year.

INDUSTRIAL PRODUCTION, BY INDUSTRIES—*Continued*

(Without Seasonal Adjustment)

[Index numbers of the Board of Governors, 1935-39 average = 100]

Industry	1947 July	Aug.	Sept.	Oct.	Nov.	Dec.	1948 Jan.	Feb.	Mar.	Apr.	May	June	July
Paper and Paper Products	*145*	*158*	*159*	*163*	*165*	*157*	*163*	*163*	*167*	*169*	*170*	*165*	*p151*
Paper and pulp	140	152	153	157	160	152	157	159	160	163	164	160	p147
Pulp	159	176	170	177	182	168	174	178	179	182	188	182	...
Groundwood pulp	96	100	98	97	103	97	91	98	96	107	112	107	...
Soda pulp	98	105	104	107	112	107	109	110	103	108	112	111	...
Sulphate pulp	253	278	259	275	281	255	276	269	285	293	309	301	...
Sulphite pulp	131	151	149	154	159	148	151	161	153	151	151	146	...
Paper	137	149	150	154	156	150	155	156	157	160	160	156	145
Paper board	166	178	182	184	186	177	187	179	192	192	191	187	165
Fine paper	75	86	87	89	89	86	86	88	85	87	86	85	77
Printing paper	147	157	157	167	168	162	162	170	161	166	169	168	158
Tissue and absorbent paper	131	148	151	154	158	153	161	167	161	173	169	160	162
Wrapping paper	124	138	135	141	146	139	145	150	148	151	150	145	143
Newsprint	89	93	97	91	91	87	82	83	82	91	95	95	91
Paperboard containers (same as Paperboard)	...	...	...	...	...	...	...	...	..	...	...	...	...

p Revised.

HOURS AND EARNINGS OF PRODUCTION WORKERS IN MANUFACTURING INDUSTRIES

[Compiled by the Bureau of Labor Statistics]

Industry group	Average hours worked per week: 1947 May	June	1948 Feb.	Mar.	Apr.	May	June	Average hourly earnings (cents per hour): 1947 May	June	1948 Feb.	Mar.	Apr.	May	June
All manufacturing	*40.1*	*40.2*	*40.2*	*40.4*	*40.1*	*39.9*	*40.2*	*120.7*	*122.6*	*128.7*	*128.9*	*129.2*	*130.2*	*131.7*
Durable goods	*40.5*	*40.7*	*40.5*	*40.9*	*40.5*	*40.1*	*40.7*	*127.8*	*130.3*	*135.2*	*135.2*	*135.7*	*136.6*	*138.5*
Nondurable goods	*39.7*	*39.8*	*39.9*	*39.9*	*39.6*	*39.5*	*39.8*	*113.0*	*114.0*	*121.7*	*122.0*	*122.0*	*123.1*	*124.2*
Paper and allied products	43.1	42.9	43.1	43.1	42.7	42.8	42.8	113.3	116.5	124.5	124.9	125.0	127.3	129.7

NOTE.—Preliminary July 1948 figures for average weekly hours and hourly earnings are: All manufacturing, 39.8 and 133.0; Durable 40.1 and 140.4; Nondurable 39.5 and 125.1, respectively. Back figures are availabl e from the Bureau of Labor Statistics.

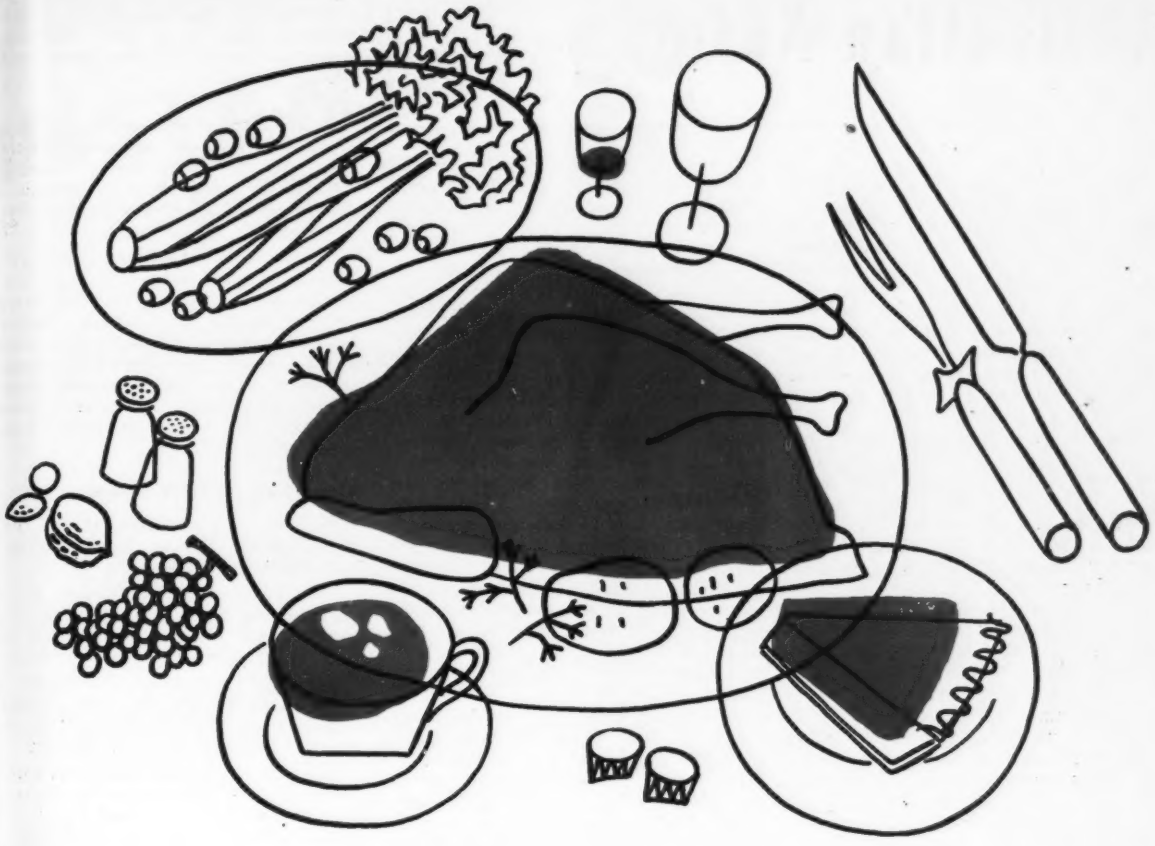
FACTORY EMPLOYMENT AND PAY ROLLS, BY INDUSTRIES—*Continued*

(Without Seasonal Adjustment)

[Index numbers of the Bureau of Labor Statistics. 1939 = 100]

Industry group or industry	Factory employment: 1947 June	July	1948 Mar.	Apr.	May	June	July	Factory pay rolls: 1947 May	June	July	1948 Mar.	Apr.	May	June
Paper and Allied Products	*146.1*	*143.3*	*148.0*	*146.8*	*146.4*	*146.7*	*144.6*	*296.3*	*303.4*	*304.2*	*330.8*	*325.7*	*331.9*	*338.3*
Paper and pulp	141	141	146	145	146	145	....	289	302	310	330	328	339	343
Paper goods, n.e.c.	154	150	152	150	151	151	....	307	302	297	328	324	328	331
Paper boxes	140	134	137	134	132	134	....	283	284	274	305	293	290	304

NOTE.—Indexes shown here for major groups and totals have been adjusted to final 1946 data made available by the Bureau of Employment Security of the Federal Security Agency. Indexes for individual industries, with the exception of those in the Transportation Equipment group, have been adjusted to final 1945 data. Back data and data for industries not here shown are obtainable from the Bureau of Labor Statistics. Underlying figures are for pay roll period ending nearest middle of month and cover production workers only. Figures for July 1948 are preliminary.



Feed

You can expect a Langston Slitter

to take any weight or grade of paper

or board and serve up *speedily*

the finest rolls ever!

It's easy as pie to get details—

just phone, write or wire

Samuel M. Langston Company, Camden, N. J.

Langston

SLITTERS AND ROLL WINDERS

Australian Notes

PERTH, WA.—Imports of newsprint during June totaled only 1,056 tons of rolls and 416 tons of sheets. This was a loss of 14,722 tons of rolls and 1,361 tons of sheets when compared with the imports of June, 1947.

Effect of dollar restrictions was felt even more solidly in imports of other papers, total imports from the United States during the month being down to an all-time low of 9 cwt. (of 112 lbs.) valued at £55.

Imports in detail were: Imitation art, 5,629 cwt. (U.K. 3,895, Finland 961, Sweden 773); duplex, 1,047 cwt. (U.K. 947, Sweden 100); other coated printing papers, 2,611 cwt. (U.K. 2,457, Finland 145, U.S.A. 9); glazed imitation parchment, 1,617 cwt. (Sweden 781, Finland 402, U.K. 247, Norway 187); lithographic, machine glazed or one-side calendered, 15,038 cwt. (Norway 11,324, U.K. 1,823, Sweden 1,630, Finland 261); offset embossed, 278 cwt. (Sweden 196, U.K. 82); other poster printings, machine glazed, 2,097 cwt. (Norway 1,142, Sweden 601, Finland 188, Czechoslovakia 104, U.K. 62); other printing papers, 67,375 cwt. (Finland 23,239, Sweden 21,811, Norway 16,536, U.K. 3,464, Netherlands 1,317, Belgium 394, Austria 298, Italy 221, Czechoslovakia 51, Canada 44).

Imports from the United States during the six months January to June have been (in hundredweights of 112 pounds): January, 15,344; February, 20,421; March, 12,092; April, 16,257; May, 1,191; and June, 9.

* * *

Due to increased costs of production, New Zealand Paper Mills has been granted an advance of £8/17/9 ($42.66 at par rate of exchange) per ton on Cap and Sandow paper, and £10/9/3 ($50.22) on kraft wrapping. Although these new rates are considered high by trade purchasers, they are still below the landed costs of most imported lines. Unfortunately, however, only limited quantities are coming forward from the New Zealand mills, but shipments are landing from Sweden to satisfy buyers' demands.

* * *

Registered recently: Russell, Sinclair Pty., Ltd., capital £10,000 ($48,000 at par); manufacturer of paperboards and paper articles. Subscribers: D. Hutchings and M. Sinclair. Registered offices, Sydney.

* * *

The recommendation of the directors of Australasian Paper, Ltd., to acquire shares in Cumberland Paper Board Mills has now been confirmed by shareholders.

* * *

Ian MacDonald, manager of Newspaper Supplies, Ltd., is retiring from that position to open a manufacturing business in Melbourne. R. Beresford Prentice will succeed Mr. MacDonald temporarily.

* * *

W. Dunstan, V.C., chairman of Newspaper Supplies, Ltd., in dealing with that company's position recently, said: "All contracts from 1949 onwards will be direct producer to consumer contracts, and the need for maintenance of Newspaper Supplies as a newsprint-buying organization disappears. Actually, Newspaper Supplies' main function since rationing began in 1941-42 has been to service the mechanical requirements of the Newsprint Pool. It is in these circumstances that Mr. MacDonald has resigned his position as manager. But I think the publishing industry owes a lot to his industry, and he will leave Newspaper Supplies with the goodwill and best wishes of myself and the board of directors."

* * *

A highway capable of carrying huge loads at fast speeds is being built through the Florentine Valley, Tasmania, where the future supply reserve for the Boyer newsprint mill is situated. This highway will eventually stretch through the forest for a matter of 30 miles.

* * *

The Commonwealth Bank, in its latest *Statistical Bulletin,* reports that factory sales of paper and printing in Victoria during April showed a rise when compared with the figures for April, 1947.

* * *

R. J. Little, West Australian Government Statistician, reports that during the six months ended December 31, 1947, imports into that State included: pulp, paper and board valued at £465,646 (£240,876 of Australian origin, £219,421 from overseas, and £5,349 of oversea origin but delivered from the Eastern States) and paper manufactures and stationery valued at £421,419 (£305,561 of Australian origin, £109,594 from overseas, and £6,264 of oversea origin).

* * *

The Acting Commonwealth Statistician reports that whereas imports of pulp, paper and board for the financial year July 1, 1946, to June 30, 1947, were valued at £9,604,000, for the year July 1, 1947, to June 30, 1948, these had increased to £17,991,000.

* * *

Discussing dollar imports recently, Professor D. B. Copland said: "Australia at present has no plan as it had in wartime, but is just drifting along behind a high level of export prices. The restriction of goods from the dollar area is hampering our own economic development."

During the first half of the 1948-49 financial year three new Australian newspaper companies have been floated with a capital of £1,156,000.

* * *

The Prime Minister (Mr. Chifley) in his latest report, says that Australia's imports from dollar countries dropped in value from 39 percent in May, 1947, to 13 percent in May, 1948.

* * *

Experiments to process rayon from eucalyptus gum fibres are being conducted in Australia by Professor George Jayme, a German scientist brought out by the Federal Government. He will also advise paper manufacturers on the uses of eucalptus cellulose. Professor Jayme said rayon was already being produced from spruce fiber.

Showing at Gift Show

BOSTON — Exhibitors at the Gift Show at the Parker House recently included the following:

Esso Textile Mfg. Co., Boston, showing lines of the Dennison Mfg. Co., Framingham, Mass. Represented by Sam Silver, William Hedenburg, Oscar Lightbody and Frank Downs.

Harry Parritz & Bro., Inc., Boston: Dennison products. Represented by Harry Parritz and Lester Shubert.

A. F. Stevenson, manufacturer's representative, Swampscott, Mass.: Nashua Gummed & Coated Paper Co., products and Pakay paper products.

Volupte, Inc., pill boxes. Represented by Norman Reiffarth and Harry Reiffarth.

Robert E. Green, Boston, representing Henry Schmidt & Bro., Inc., Philadelphia, fancy gift boxes and folders; Royal Paper Corp., New York City, gift wrapping papers in counter rolls; Smith-Stewart Paper Products Co., Inc., Brooklyn, N. Y., gift wrapping paper in packages; United Board & Carton Corp., Inc., New York City, garment boxes and millinery boxes.

Howard W. Jencks Co., Inc., Providence: Christmas and everyday gift wraps, tags, white and colored tissue, crepe paper, Scotch tape, paper napkins and tablecloths, lace doilies. Represented by Howard W. Jencks and Jane Hale Clarke.

Mautner Company, Inc., New York City, manufacturer of paper boxes for jewelry and silverware, cards, tags, tissue and wrapping papers. Represented by Arthur B. Wright, Boston.

Entertain Investment Men

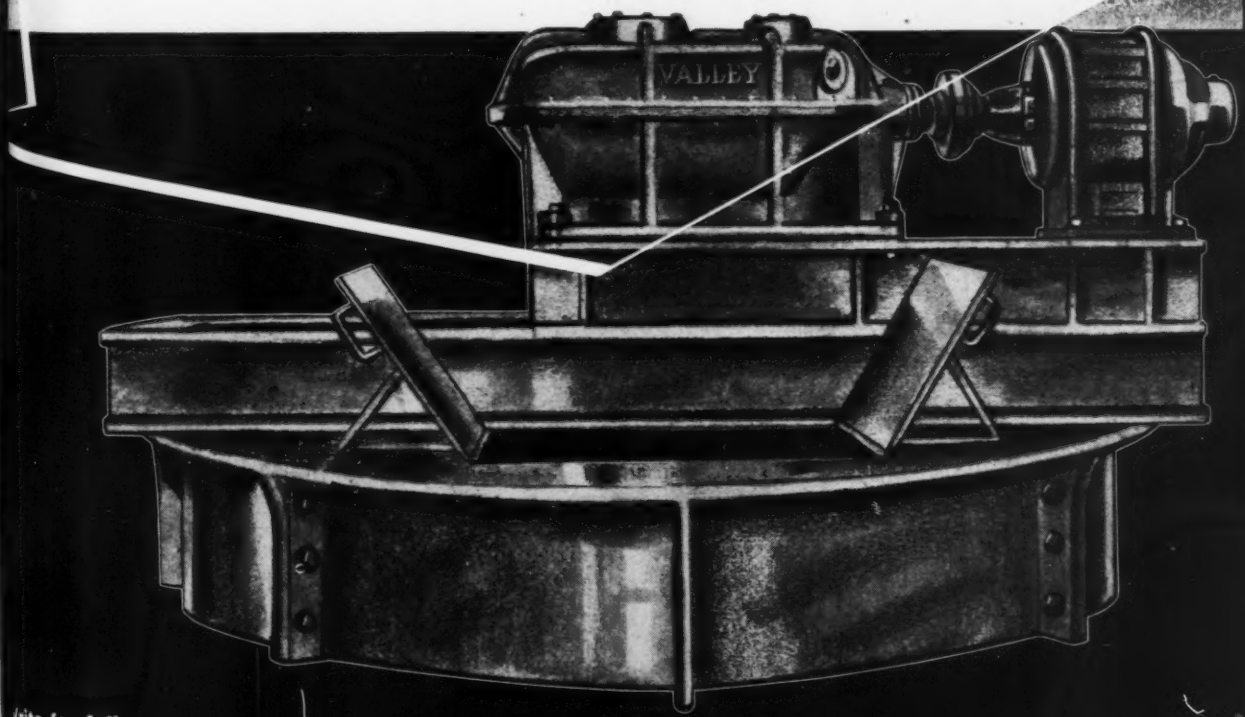
VANCOUVER, B. C.—Officials of the B. C. Pulp & Paper Co. recently entertained local investment men at the firm's Woodfibre plant. Headed by W. J. Borrie, chairman of the Pacific District Investment Dealers of Canada, the visitors motored to Horseshoe Bay and then travelled by yacht to Woodfibre, where they were the guests of the company at a luncheon. The party returned to Vancouver the same day.

INSTANTANEOUS PULPING!

because . . . All the pulp hits an explosion chamber the instant it is fed, and emerges — PULPED.

because . . . All pulp is instantaneously wetted.

because . . . The guided vaned circulation channels of this great pulper assures positive vigorous circulation and prevent by-passing and dead spots.



rite for full
formation
ALLEY IRON WORKS
ppleton, Wisconsin

THE VALLEY-VORTEX PULPEI

Trends

Office of the PAPER TRADE JOURNAL,
Wednesday, October 13, 1948.

Observers of the nation's economic trends are watching for storm signals indicating that a collapse in demand has set in, particularly so because such a collapse in demand tumbles commodity prices. And since such collapses are said to have come in the year's last quarter, economists are keeping alerted to consumer demand.

During the week ended October 8, retail volume in durables is reported by Dun and Bradstreets to have shown moderate increase. "Curtains and draperies and other home furnishings sold well. Furniture and hardware volume was steady at a high level. Consumer demand for washers, ranges and small electrical appliances was reported to have declined in some sections of the country. Consumer interests in television sets continued at high level. Demand for steel pipe, carpenters' tools and other steel items remained very high. . . . Total wholesale order volume rose slightly for the week ended Wednesday, October 6 and continued to be fractionally above that of 1947's week. Many retailers continued to re-order for nearby and prompt deliveries of Fall and Winter merchandise in efforts to replenish current inventories. . . . Trading volume in cotton textiles continued at a rather low volume . . . new orders for osnaburgs for prompt and nearby delivery rose moderately. . . . There were scattered purchases of sheetings for quick delivery; print cloth volume remain limited. Volume of wide industrial gray goods rose slightly with increased new orders for broken twills and drills and for sateens. Buyer demand for cotton yarns was up fractionally for nearby delivery. Trading volume in woolens and worsteds were slightly below last week's low level. . . . Wholesale volume of building materials and hardware decline moderately during the week. New orders for toys and holiday merchandise rose noticeably in many localities. Buyer demand for furniture and household appliances continued at high level.

Distributors Report

After reporting last week on market conditions as viewed from the mills standpoint, it is somewhat pleasanter writing up the distributors' opinions. Consumer demand is good. Following the summer's slump, it has gathered momentum steadily and is now at sustained good level on a buyers' market. In the fine paper field, dealers report steady and good demand for *rag contents* despite the summer price rises, particularly for 25 percent and 100 percent. Opinions about the *rag content* slump were interesting and varied. Some believe that the heavy production developed during wartime shortages of sulphites must now recede. Whether such recessions will be to prewar levels seems somewhat unlikely in view of the excellent sulphites which have been developed at lower prices than *rags*. Should *rag contents* be able to compete pricewise with sulphites, the story would probably be altered. It is believed by some that 25 percent will continue to meet a brisk demand for "doggy" appearance, likewise some of the 50 percent, that the 100 percent will have sustained demand in legal and banking circles, but that 75 percent will gradually lose its market.

Dealers say they are selling from inventories, particularly those items which they were obliged to take from the mills in order to get others. Sulphites are reported in good supply except No. 4's. Orders going to the mills are only for minimum and immediate requirements.

Pricewise: *glossy coateds* and other *books* have advanced the one-half cent per pound anticipated in *Trends* of September 30. No change in sulphites, either bond or ledger, is seen as likely. There is a faint suggestion that the market is requiring a reversal of summer *rag content* advances.

Towel Prices

Folded towels, per case of 3750, advanced 30 cents per case for White Jr. 9½ by 9½, other sizes taking the rise according to size and pack. (See Prices page.)

Wood Pulp

ECA authorizations for the purchase of wood pulp include $5,871,000 from Canada and Newfoundland, $488,000 to Finland for groundwood for Germany, $71,000 for high alpha for France from U.S.A., and $9,054,000 to Sweden. This Swedish figure includes $2,210,000 rayon grade to Germany, $339,000 groundwood to Germany, $1,760,000 unbleached sulphite to Germany, $335,000 refined bleached sulphite to Germany, $3,332,000 kraft to Germany. Recent authorizations for Bizonia totaling $5,347,000 worth of wood pulp from Sweden were being watched anxiously by U.S. consumers, in view of recent downward price adjustments. Assurances were given by ECA's Paul Hoffman that the U.S. market condition on wood pulp was being considered carefully.

Of this latter allotment, it is noted that $1,760,000 was for unbleached sulphite and $355,000 in refined bleached sulphite from Sweden.

Bleached Sulphite Trend

In order to study basic trends involved and to compare them with the broad trends affecting the industry as a whole, the Ass'n. of Pulp Consumers made a special review of bleached sulphite under date of September 17. Related excerpts follow:

"The new supply (production, plus imports, minus imports) of all grades of bleached sulphite for the 11-year period, 1937 throught 1947, were compared. . . . It is noted that even with the inclusion of dissolving pulps in bleached sulphite figures, the growth in total bleached sulphite from 1937 to 1947 has been only 44 percent compared with the growth of 64 percent in the supply of all grades of pulp during the same period. . . . The figures reveal clearly the tremendous growth in dissolving grades and lack of growth of the supply of paper grade pulp. Both receipts and consumption for the first seven months of this year are running slightly ahead of the comparable period of last year. . . . The inventory shows a substantial improvement during the past nineteen months. . . . Domestic receipts for the seven months ended July, 1948, showed a decline which is attributable to labor trouble and flood conditions which affected the production of several of the West Coast mills during the first half of 1948. . . . European receipts are substantially ahead of last year, but the rate of increase is not expected to continue during the remainder of the year. . . . Consumption and inventory analysis, using the Bureau of Census comparison between partially integrated and non-integrated mills, reveals that the more-than-seasonal drop in consumption during July affected only the wholly non-integrated mills. This caused their inventories to jump nearly 14 percent during the month to a new post-war high of 91,940 tons with July consumption at 33,295 tons. . . . An interesting sidelight to the consumption-inventory ratios is the revelation that companies consuming pulp of own manufacture can sustain operations on about 1/10th of the inventory required by non-integrated mills for a similar volume. Aside from the risk involved, this represents a substantial addition to the working capital requirements of the non-integrated mill. . . . European bleached sulphite of 60,000-70,000 tons per year has come from Sweden and Finland with Norway shipping a minor quantity. . . . In reviewing the foregoing, it seems reasonable to conclude that while the long term trend in supply of bleached sulphite is still upward, it is not expanding at the same rate as the supply of all grades of pulp. The basic trend is definitely down in relationship to both growth of population and expansion of the paper industry."

The Boston market reported spot bleached sulphite offered by a Canadian mill at $150.00 delivered, a price $15.00 over the market level. This was taken to indicate heavy demand for bleached sulphite above domestic contract levels.

("Indexes" on page 54)

TRI-CLAD

REG. U.S. PAT. OFF.

SPEED SYNCHRONOUS MOTORS AND GENERATORS

These new synchronous motors and generators bring you the famous TRI-CLAD improvements:

Extra Protection Features!—against physical damage—against electrical breakdown—against operating wear and tear.

New Styling!—smooth, rounded contours—baffled ventilating louvers—smooth-corners on exciters and conduit boxes.

Following General Electric design leadership, the new line of Tri-Clad synchronous motors and generators give you the same design features that made Tri-Clad motors so successful in more than a million and a half industrial applications.

Tri-Clad construction gives you protection where it counts. Frames and end shields with no openings above the center line—give protection against dripping liquids, falling objects, and accidental blows.

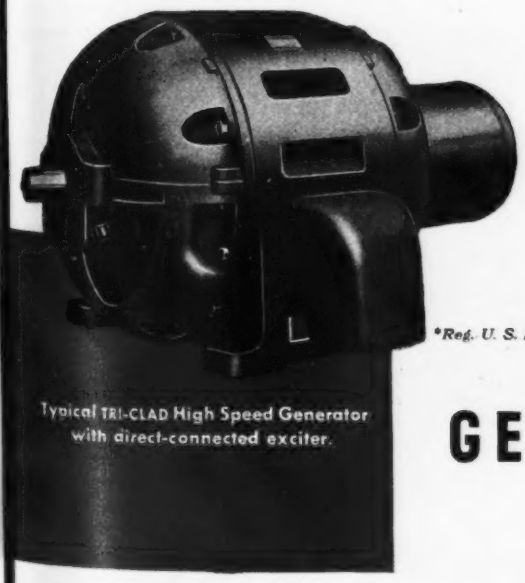
You get protection against electrical breakdown in normal operations. Proved insulating materials of the highest quality are used throughout. Small sizes (through frame 945) use Formex* wire for low voltage windings. Larger size coils are form wound and molded accurately to slot size.

Bearings are completely enclosed in cast iron with close running fits for long life with minimum maintenance. Deep oil reservoirs insure adequate lubrication with clean, cool oil.

You can get synchronous motors in the new Tri-Clad design in ratings from 20 hp to 1000 hp at 60 cycles, speeds from 514 to 1800 rpm. Synchronous generators are available from 12½ to 1250 kva. Direct connected exciters are available for any rating.

About ten years ago, the Tri-Clad design was introduced to combine the important features demanded by industry. Since then, it has been further improved with additional refinements—all of which have been incorporated in this new line of synchronous motors and generators.

For more information on how you will benefit from Tri-Clad construction in your synchronous motor and generator installations, contact your nearest G-E sales engineer. For detailed construction features, write for GEA-5113 (Motors) or GEA-5125 (Generators). *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



Typical TRI-CLAD High Speed Generator with direct-connected exciter.

*Reg. U. S. Pat. Off.

GENERAL ELECTRIC

770-1

Imports

Week Ending Oct. 9

NEW YORK

Newsprint

N. Y. Journal American, Markland, Liverpool, N.S., 483 rolls.

N. Y. Herald Tribune, Markland, Liverpool, N.S., 1761 rolls.

N. Y. World Telegram, Markland, Liverpool, N.S., 724 rolls.

Brooklyn Eagle, Markland, Liverpool, N.S., 701 rolls.

Herald Statesman Inc., Markland, Liverpool, N.S., 42 rolls.

Richmond Newspapers Inc., (Richmond, Va.), Markland, Liverpool, N.S., 1782 rolls.

Price & Pierce, Ltd., Markland, Liverpool, N.S., 151 rolls.

H. G. Craig Co., Newscarrier, Donnacona, 338 rolls.

Pagel Horton & Co., Inc., Lyngenfjord, Brevik, 535 rolls.

Montmorency Paper Co., Storfjeld, Botwood, 4324 rolls.

H. G. Craig Co., G.D.D., Donnacona, 351 rolls.

R. A. Olsen, Donpaco, Donnacona, 330 rolls.

R. A. Olsen, Newscarrier, Donnacona, 365 rolls.

Montmorency Paper Co., Mercator, Botwood, 1257 rolls.

Montmorency Paper Co., (Alexandria, Va.), Mercator, Botwood, 1502 rolls.

News Syndicate Co., Ethel Tombs, Gatineau, 279 rolls.

H. G. Craig Co., G.T.D., Donnacona, 340 rolls.

Madden Reeve Angel & Co., Inc., Krageholm, Kotka, 711 rolls.

Surface Coated Paper

Gevaert Co. of America, Arkeldyk, Antwerp, 7 cs.

Serviettes

(———), Mauretania, Southampton, 13 cs.

Rags, Baggings, etc.

(———), Exchange, Leghorn, 62 bls. scrap jute burlap bagging, 30 bls. old khaki cottons.

F. Cantasano, Exchange, Leghorn, 16 bls. rags.

E. J. Keller Co., Inc., Meridian Victory, Venice, 153 bls. waste bagging.

(———), Meridian Victory, Venice, 73 bls. old colored cottons.

E. J. Keller Co., Inc., Manchester Division, Glasgow, 62 bls. linen waste.

(———), Manx Marine, Bombay, 35 bls. old jute rags.

New England Waste Co., Manx Marine, Bombay, 630 bls. cotton waste, 200 bls. old hessian rags.

C. Comiter, Manx Marine, Bombay, 120 bls. old jute rags.

E. J. Keller Co., Inc., Manx Marine, Bombay, 22 bls. hessian cuttings.

(———), Mount Rogers, Bombay, 100 bls. jute rags.

New England Waste Co., Mount Rogers, Bombay, 50 bls. cotton waste.

E. J. Keller Co., Inc., Mount Rogers, Bombay, 158 bls. old jute rags.

W. Intner Co., Mount Rogers, Bombay, 300 bls. cotton waste.

Midwest Waste Material Co., Mount Rogers, Genoa, 48 bls. scrap bagging.

Old Rope

(———), City of Lyons, Madras, 80 bls. old hemp rope cuttings.

Hidecuttings

John Gorvers, Cape Ann, Cartagena, 52 rolls.

Woodpulp

Price & Pierce, Ltd., Markland, Liverpool, N.S., 4299 bls. unbleached sulphite pulp.

Woodpulp Boards

Jay Madden Corp., Krageholm, Kotka, 259 rolls (solid white).

BALTIMORE

Pulp Sales Corp., Krageholm, Kotka, 1219 bls. white dry mechanically ground woodpulp; 905 bls. prime unbleached kraft sulphite pulp; 125 bls. prime unbleached strong bleachable sulphate pulp; 130 bls. prime strong unbleached bleachable sulphite pulp; 799 bls. prime bleached extra strong sulphite pulp; 260 bls. prime unbleached strong sulphite pulp.

Madden Reev Angel & Co., Inc., Krageholm, Kotka, 991 rolls newsprint.

Pulp Sales Corp., Krageholm, Jakobstad, 795 bls. prime unbleached extra strong sulphite pulp.

PHILADELPHIA

Pulp Sales Corp., Krageholm, Kotka, 1666 bls. white dry mechanically ground woodpulp; 3033 bls. prime unbleached extra strong sulphite pulp.

Madden Reeve Angel Co., Inc., Krageholm, Kotka, 1456 rolls newsprint.

H. Adlerstein, Manx Marine, Genoa, 64 bls. dark cotton rags.

BOSTON

The Borden Co., Chemical Division, Celestial, Buenos Aires, 500 bags ground lactic casein.

WILMINGTON

San-Nap-Pak Manufacturing Co., Inc., Krageholm, Halmstad, 375 bls. dry sulphite pulp, 758 tons.

LOS ANGELES

Castle & Overton, Inc., Mount Rogers, Bombay, 100 bls. old jute rags.

Darmstadt Scott & Courtney, Mount Rogers, Bomboy, 220 bls. jute rags.

Castle & Overton, Inc., Mount Rogers, Genoa, 75 bls. bagging.

SAN FRANCISCO

J. Dzbanck, Mount Rogers, Leghorn, 209 bls. old dark cotton rags.

Port Handling Charge Proposal Opposed

NEW YORK — A $1,100,000 increase annually in the landed cost of woodpulp is the estimated penalty to importers and consumers if the proposed 6 cents per 100 pounds port handling charge is adopted by the railroads. Speaking before approximately 250 persons, and basing his statements on the total of more than 825,000 long tons imported in 1947, Stacey Bender, Jr., traffic manager of Elof Hansson, Inc., representing the Ass'n. of American Woodpulp Importers at the second public hearing on the proposal, declared that this would put European woodpulp at a distinct disadvantage in the U.S. market.

Other speakers termed it a "new road block to export trade," "perhaps one way to get the St. Lawrence waterway built," and still others sized it up as "one port prompting this solution for all ports," and that "railroads would be pricing themselves out of the export market."

Few of those present disagreed with these statements, although a few remarks in rebuttal were made by N. W. Hawkes, the chairman of the day. The hearing was held in the New York State Chamber of Commerce building on October 1, and was the second conducted on the proposal, the first having taken place in Chicago on September 15, at which time a strong protest was also made by the American Ass'n. of Woodpulp Importers. Every indication was given that the matter will go on to the Interstate Commerce Commission and will continue to be fought by shippers and port authorities if the railroads do not withdraw the proposal.

Imports Decrease

Imports of wood pulp into the United States in August decreased in tonnage for the second consecutive month of 1948, the Dept. of Commerce announced through its Office of International Trade. Total wood pulp imports showed a 35-percent decrease due to the reduction of imports from the Scandinavian countries which were 69 percent less than in August 1947 and 14 percent under July 1948. Pulp imports from Sweden were 5 percent under July 1948 and down 69 percent from the Aug. 1947 figure. For the same period, imports from Finland were down 25 percent and 70 percent. Pulp imports from Canada in Aug. 1948 totaled 131,206 tons, an increase of 10,764 tons or 9 percent over Aug. 1947, according to data issued by the Bureau of the Census.

Indexes

(Continued from "Trends," page 30)

Index of general business activity for the week ended October 2 declined to 146.8 from 147.0 in the preceding week, compared with 140.8 in the corresponding week of 1947.

Index of paperboard production rose to 173.2 from 170.9 in the preceding week, compared with 160.3 in the corresponding week of 1947.

Comparative ratios of U. S. paper and paperboard production to mill capacity as reported by AP&PA are shown below:

	Oct. 2 1948	Sept. 25 1948	Oct. 4 1947	Oct. 5 1946	Oct. 6 1945
Paper**	99.6‡	98.4	109.5	107.2	94.1
Paperboard ..	96.0	94.0	100.0	100.0	95.0

** Indicates 1948 volume of 179,083 tons. Comparable week, 1947, 173,539 tons. ‡ Revised figure.

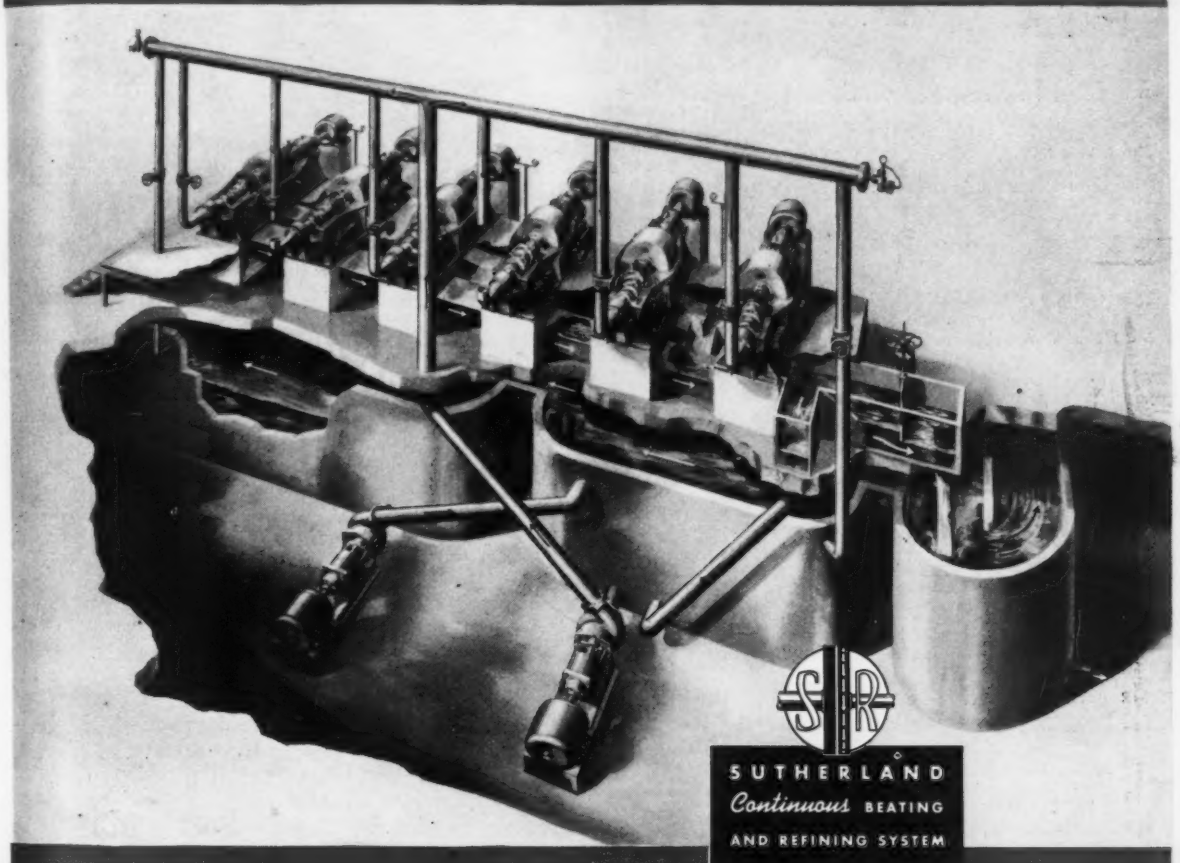
Paperboard Production (Tons)

	Oct. 2 1948	Sept. 25 1948	Sept. 1948 (5 wks.)
Production	191,033	188,146	898,608
New Orders ...	209,094	165,103	943,990
Unfilled Orders .	375,884	358,586	375,884

Percent of Activity: Current 96%
Percent of Activity: Year 96%
Percent of Activity: Average 91%

Problem

Building costs are sky-high, so if your present stock preparation room is jam-packed with equipment and you need more, it means real money and possibly delays in getting building materials.



Solution

Put Sutherlands in where you now have your stock preparation equipment. You'll get more stock and have space left over, and get results quickly. Cut your capital investment by saving the cost of a building and get increased tonnage without sacrifice of quality.

• • •

SUTHERLAND REFINER CORPORATION · TRENTON, NEW JERSEY

Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin

SUTHERLAND REFINER LIMITED, 319 DRUMMOND BUILDING, MONTREAL P. Q.

SUTHERLAND

Prices

Quotations indicate trends in an open market. At the moment they can be of little more value. While some volume business still is done under contract at the figures shown, fluctuations are too varied and frequent to permit prices to be interpreted as representing a wholly stabilized market.

NEW YORK

Paper

(Delivered New York)

Standard News, per ton—	
Rolls, contract	$96.00/100.00
Sheets	111.00/ —
Kraft—per cwt.—Carload Quantities Zone A Deld. 40 lb. base wgt.	
Superstandard Wrapping	$9.00/ —
No. 1 Wrapping	7.75/ 8.00
Standard Wrapping Rolls	7.00/ —
Standard Wrapping Sheets	7.50/ —
Standard Bag	6.50/ —
Tissues—Per Ream 24x36 (480) 11 lbs. Zone 1.	
Wh. No. 1 Frd.	$1.84/$2.00
Wh. No. 1 M. G.	1.94/ 2.00
Wh. No. 1½	— / —
Wh. No. 2	1.75/ —
Kraft Anti-Tar	1.65/ —
Kraft Unbl.	1.85/ —
Shred. Wh. No. 1 per lb.	.12¾/ .18
Toilet—Per Case of 100 rolls—1 M Sheets.	
Unbleached	$7.50/$10.00
Bleached	8.75/ 10.00
Paper Towels—Per Case of 3750—Zone 1.	
Wh. Jr. M'tif'd 9¼x9½	$5.45
Br. Sr. M'tif'd 10x12	3.80
Br. Jr. M'tif'd 9½x9¾	3.30
Br. Jr. Sgl. fold 10x10¾	3.35
Manila—per cwt.—C-1 f.a.	
No. 1 Jute Tag	$14.50/ —
Reg. Jute Manila	13.25/$15.50
No. 1 Manila Wrapping	9.75/ —
5 lb. Manila	10.75/ 11.25
Boards, per ton—	
Filled News	94.00/ —
Plain Chip	90.00/ —
Blchd. Mla. L-d. Chip*	105.00/ —
White Pat. coated*	120.00/ —
Kraft Liners 42 lb.	105.00/ —
Kraft Corr. .009	110.00/ —
Binders Boards	126.00/ —

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—

White, 16 lb.

Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$59.00	$54.55	$52.30
100% Rag	52.25	48.30	46.30
75% Rag	41.50	38.30	36.70
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Ledgers, per cwt.

100% Rag Ext. No. 1	$57.00	$52.65	$50.50
100% Rag	50.25	46.40	44.50
75% Rag	41.50	38.30	36.70
50% Rag	33.75	30.70	29.50
25% Rag	30.25	27.45	26.35

Sulphite Bonds and Ledgers—

White, 16 lbs.

Bonds, per cwt.

No. 1	$21.25	$19.25	$18.50
No. 2	20.25	18.30	17.55
No. 4	19.25	17.55	16.85

Ledgers, per cwt.

No. 1	$21.75	$19.65	$18.85
No. 2	20.75	18.75	18.05
No. 4	20.00	18.10	17.35

White Book, per cwt.—

Coated

	Case	Ton
No. 1 Glossy	$20.90	$20.15
No. 2 Glossy	19.65	18.90
No. 3 Glossy	18.90	18.25
Machine Coated	16.65 to 17.15	16.05 to 16.35
Uncoated		
No. 1 Antique (Watermarked)	16.40	15.80
Offset	15.15 to 17.15	14.60 to 16.40
A Grade E. F.	15.40	14.85
A Grade S. C.	15.90	15.35
B Grade E. F.	15.15	14.55
B Grade S. C.	15.65	14.95

Wood Pulp

Fourth Quarter

Domestic mill contract prices delivered with varying freight allowances.

	Per Short ADT
Groundwood	$80.00/ $81.00
Unbleached Sulphite	124.00/ —
Bleached Sulphite	125.00/ 135.00
Bleached Soda	130.00/ 135.00
Bleached Sulphate	155.00/ 165.00
Unbleached Sulphate Northern	120.00/ 130.00
Unbleached Sulphate Southern	110.00/ 125.00

Canadian Quotations

Prices delivered with varying freight allowances unless otherwise specified:

	Per Short ADT
Bleached Sulphate	$150.00/$160.00
Unbleached Sulphate	125.00/ 135.00
Unbleached Sulphite	125.00/ 126.00
Bleached Sulphite	125.00/ 135.00
Glassine Unbleached Sulphite (no freight allowance)	120.00/ —
Bleached Soda	130.00/ —
Groundwood	80.00/ 85.00
Sideruns Pulping News	80.00/ 90.00

Swedish Quotations

On dock, Atlantic Ports

Bleached Kraft	$165.00/ —
Bleached Sulphite	165.00/ —
Unbleached Sulphite	140.00/ 149.00
Unbleached Kraft	127.50/ —

Finnish Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite	$165.00/ —
Unbleached Sulphite	140.00/ 143.00
Unbleached Sulphate	127.50/ —

Norwegian Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite	$165.00/$175.00

New Domestic Cotton Cuttings

(F.o.b. Ship. Pt. Plus Dealer's Commission)

White Shirt	$11.00/ $11.50
Unbleached Muslin	11.50/ 12.00
Light Silesias	9.00/ 9.25
White Back Blue Overalls	9.00/ 9.50
Blue Overalls	8.00/ 8.25
Fancy Shirt	6.50/ 7.00
Light Percales	8.50/ 8.75
Light Prints	7.50/ 7.75
No. 1 Washables	5.00/ 5.25
Bleachable Khaki	7.00/ 7.50
Unbleachable Khaki	6.00/ 6.50
Cottonades	5.50/ 5.75

Old Domestic Cotton Rags

(F.o.b. Ship. Pt. Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites, Repacked	$5.50/ $6.00
No. 1 Whites Miscellaneous	4.50/ 5.00
No. 2 Whites Repacked	3.50/ 3.75
No. 2 Whites Miscellaneous	3.00/ 3.50
Blue Overalls	3.75/ 4.00
Thirds and Blues Repacked	3.25/ 3.50
No. 1 Roofing Rags	1.60/ 1.70
No. 2 Roofing Rags	1.50/ 1.60
No. 3 Jute Bagging	1.40/ 1.50
No. 4 Brussels & hrd. bck'd crpts.	1.40/ 1.50
No. 5A Roofing Rags	1.40/ 1.50

New Foreign Cotton Cuttings

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
New Dark Cuttings	$5.50/ $5.75
New Mixed Cuttings	6.25/ 6.50
Light Silesias	9.25/ 9.50
Light Flannelettes	9.25/ 9.50
New White Cuttings	12.00/ 13.00
New Unbleached Cuttings	12.25/ 13.00
Fancy Shirt Cuttings	6.50/ 7.00
Light Prints	7.75/ 8.00
Bleachable Khaki, No. 1	7.00/ 7.50
Unbl. Khaki, No. 1	6.25/ 6.75

Old Foreign Rags

(Prices to Mill, F.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Cottons	$8.00/ $10.00
No. 2 White Cottons	7.00/ 8.00
No. 3 White Cottons	6.00/ 6.50
No. 4 White Cottons	4.00/ 4.50
Extra Light Prints	6.50/ 7.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	4.00/ 4.50
Dutch Blue Cottons	5.25/ 5.50
Checks and Blues	4.00/ 4.25
Linsey Garments	2.30/ 2.40
Dark Cottons, European	2.20/ 2.30
Dark Cottons, Egyptian	3.20/ 3.30
Old Shopperies	2.10/ 2.20
New Shopperies	2.15/ 2.25

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs
Foreign Gunny, No. 1	$7.25/ $7.50
Domestic Gunny, No. 1	7.25/ 7.50
Heavy Wool Tares	6.50/ 6.75
No. 1 Scrap Baggings	6.00/ 6.25
Roofing Bagging	1.50/ 1.75
Foreign Manila Rope	6.00/ 6.25
Domestic Manila Rope	6.25/ 6.50
Jute Strings	5.00/ 5.25
No. 1 Sisal Strings	5.25/ 5.50
Mixed Strings	1.75/ 2.50

Waste Paper

Base Prices to Mills for Average Packings F.o.b. New York, Baled

	(Per Ton)
No. 1 Hard White Envelope Cuts	110.00/ 120.00
No. 1 Hd. Wh. Shavings, unruled	100.00/ 110.00
Super Soft White Shavings	100.00/ 105.00
No. 1 Soft White Shavings	90.00/ 95.00
No. 1 Fly Leaf Shavings	45.00/ —
No. 1 Gd'wd Fly Leaf Shavings	35.00/ —
No. 1 Heavy Books & Magazines	19.00/ 21.00
Mixed Books	13.00/ 15.00
No. 1 White Ledger	60.00/ 65.00
Col. Ledger	40.00/ 45.00
Manila Tab. Cards	65.00/ 70.00
New Manila Envelope Cuttings	70.00/ 80.00
Extra Manilas	20.00/ 25.00
Mxd. Kraft, Bag Cuttings	60.00/ 70.00
Kraft Envelope Cuttings	80.00/ 90.00
Triple Sorted, No. 1 Brown Soft Kraft	40.00/ 45.00
New Kraft Corrugated Cuttings	35.00/ 40.00
No. 1 Assorted Old Kraft	35.00/ 40.00
Used Kraft Bags	35.00/ 40.00
New Jute Corrugated Cuttings	18.00/ —
Old Corrugated	14.00/ 15.00
No. 1 News	12.00/ 13.00
No. 1 Mixed Papers	7.00/ 8.00
Box Board Cuttings	7.00/ 8.00
White Blank News	65.00/ 70.00
Overissue News	16.00/ 18.00
Mill Wrappers	14.00/ 16.00

Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)

Coarse Polished—India	.35½/ .36½
Fine Polished India	.41½/ .45
Unpolished—Paper Makers	.32¼/ .34½
Tube Rope	.33¼/ .35½
Wrapping	.36 / .38¾
Cotton	.58 / .60
Polished Cotton	.55 / —
(Hard Fiber)	
Mex. Sisal	.21 / .27
Manila (Reprocessed)	.31 / .35
(American Hemp)	
Polished Hemp	.46½/ .48
Unpolished	.35 / .37¼

PHILADELPHIA

Domestic Rags (New)

(F.o.b. Eastern Shipping Point)

White Shirt	.10½/ .11
Light Silesias	.07½/ .08
Black Silesias, soft	.05½/ .06
Unbleached Muslin	.10½/ .11¾
Washable Prints	.06½/ .07
Washable No. 1	.05 / .05½
Blue Overall	.07¼/ —
Washable Shredding	.02¾/ .03¼
Fancy Percales	.06¾/ .07¼
Unbleachable Khaki	.05½/ .06½
Bleachable Khaki	.06¼/ .06¾
Men's Corduroy	.05½/ .06
Ladies' Corduroy	.05 / .05½
Cottonades	.05½/ .06

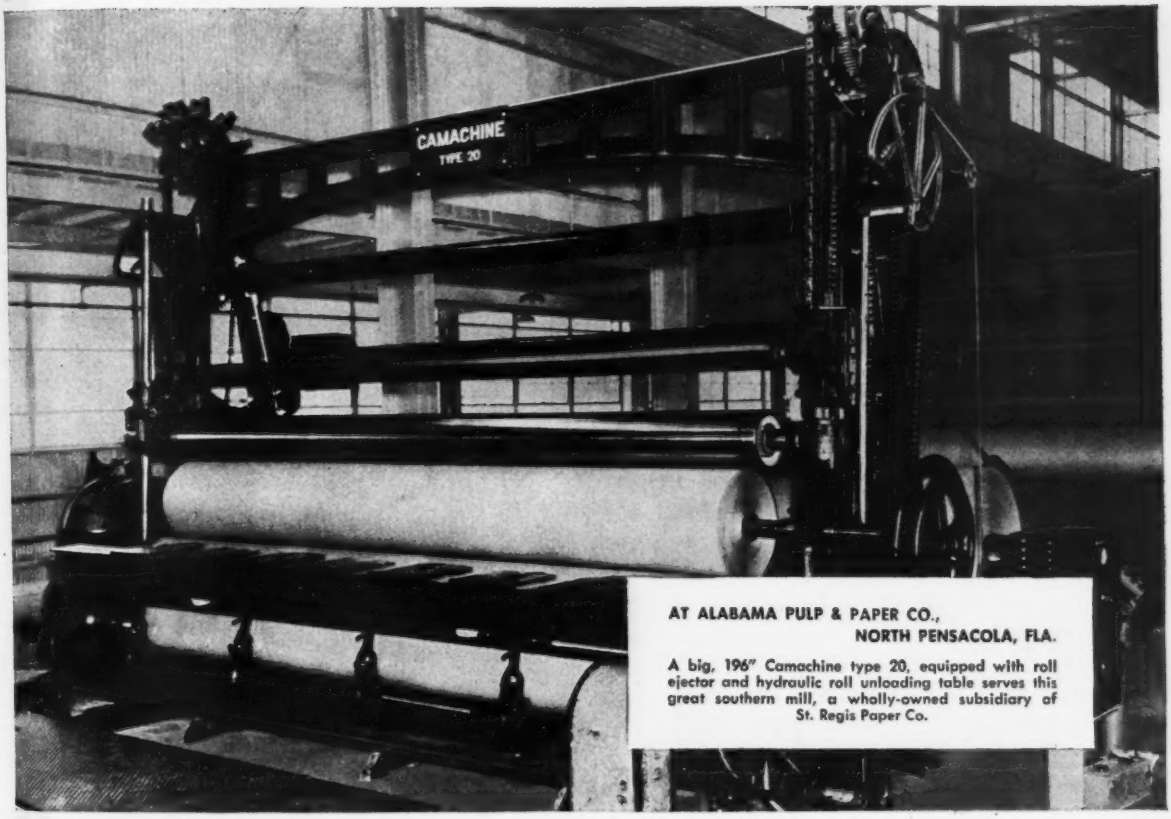
Domestic Rags (Old)

(F.o.b. Eastern Shipping Point)

White No. 1—Repacked	4.50 / 5.00
Mixed White	4.00 / 4.25
White No. 2—Repacked	3.50 / 3.75
Thirds and Blues—	
Miscellaneous	2.50 / 2.75
Repacked	3.00 / 3.25
Domestic No. 1 Roofing Stock	1.55 / 1.60
Domestic No. 2 Roofing Stock	1.45 / 1.50
Roofing Bagging	1.35 / 1.40
Old Manila Rope	— / 5.50

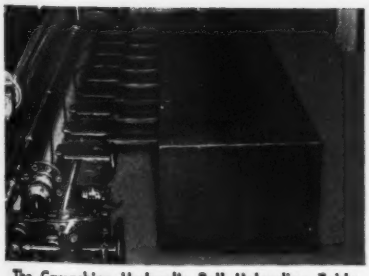
(Continued on page 38)

NOW it's easy to unload heavy rolls...



AT ALABAMA PULP & PAPER CO., NORTH PENSACOLA, FLA.

A big, 196" Camachine type 20, equipped with roll ejector and hydraulic roll unloading table serves this great southern mill, a wholly-owned subsidiary of St. Regis Paper Co.



The Camachine Hydraulic Roll Unloading Table, operated by pushbutton control is raised to receive the finished roll from the winder . . . and (below) lowered, stop-and-hold — at any point down to floor level.

AA-182

The Camachine Hydraulic Roll Unloading Table is only one of many post-war developments which have been made available on famous mill-type Camachines.

Other exclusive Camachine developments which you can't afford to overlook are: the pneumatic brake on drive and idler roll; push-button controlled, motor-driven riding-roll lift and roll ejector; and pneumatically controlled pressure on the cutter wheels and cotter spacer bar.

Camachine literature will bring you up-to-date on modern Camachine slitting and roll-winding equipment for all paper mill and converting plant requirements. Write today...

CAMERON MACHINE COMPANY • 61 Poplar Street, Brooklyn 2, N.Y.

Camachines

FOR FAST, TOP QUALITY ROLL PRODUCTION

...the world over

Prices

CONTINUED FROM PAGE 36

Bagging

(F.o.b. Eastern Shipping Point)

Foreign Gunny No. 1	nominal
Domestic Gunny No. 1	.07¼/ .07¾
Sisal Strings No. 1	.04½/ .05
Sisal Strings No. 2	.03½/ .04
Sisal Jute	.02¼/ .03
No. 1 Scrap	.06½/ .07
No. 2 Scrap	.03 / .03½

Old Papers

F.o.b. Phila. Mill Prices, Baled

	Per Ton
No. 1 Hd. White Envelope Cuts	120.00/ 125.00
No. 1 Hd. Wh. Shavings, unruled	100.00/ —
Soft White Shavings	85.00/ —
White Blank News	65.00/ 75.00
No. 1 White Ledger	65.00/ —
No. 1 Heavy Books & Magazines	20.00/ 22.00
New Manila Envelope Cuttings	75.00/ —
No. 1 Assorted Old Kraft	35.00/ 40.00
No. 1 Mixed Paper	7.00/ 8.00
Box Board Cuttings	8.00/ 10.00
New Kraft Corrugated Cuttings	55.00/ 60.00
Old Corrugated	14.00/ 16.00
Overissue News	15.00/ 16.00
No. 1 News	11.00/ 13.00

BOSTON

Old Papers

F.o.b. Boston, Mill Prices, Baled

	Per 100 lbs.
No. 1 Hd. Wh. Shavings, unruled	$6.25 /$6.75
No. 1 Hard White Shavings, ruled	6.00 / 6.50
Soft White Shavings	6.00 / 6.25
No. 1 Fly Leaf Shavings	— / —
No. 2 Fly Leaf Shavings	4.25 / —
No. 1 Grdwd. Fly Leaf Shvgs.	1.75 / 2.00
No. 2 Groundwood Fly Leaf Shavings	1.50 / 1.75
Mixed Colored Shavings	2.00 / 2.25
New Manila Env. Cuts, one cut	4.50 / 4.75
Hard White Envelope Cuts, one cut	7.00 / —
Triple S'ted No. 1 Br. Soft Kraft	3.75 / 4.00
Mixed Kraft Env. & Bag Cuttings	4.00 / 4.25
Kraft Envelope Cuttings	5.00 / 5.50
No. 1 Heavy Books & Magazines	1.75 / —
New Manila Env. Cutt'gs, one cut	2.35 / —
New Manila Envelope Cuttings	4.00 / 4.25
White Tabulating Cards	5.00 / —
Groundwood Tabulating Cards	1.50 / 1.75
White Blank News	2.25 / 2.50
No. 1 Assorted Old Kraft	3.50 / 4.00
No. 1 Mixed Paper	.47½/ —
Overissue News	.90 / 1.00
No. 1 News	.55 / .60
Box Board Cuttings	.60 / .70
New Corrugated Cuttings, Kraft	2.75 / 3.00
Old Kraft Corrugated Containers	2.00 / 2.25
Old Corrugated Containers	— / 1.10
Jute Corrugated Cuttings	1.07½/ —
Paper Strings	2.00 / 2.25

Bagging

(F.o.b. Boston)

Foreign Gunny	nominal
Domestic Gunny	7.00 / —
No. 1 Old Rope	6.25 / —
Mixed Strings	1.50 / —
Transmission Rope—	
Foreign	nominal
Domestic	3.00 / 3.50
Foreign Manila Rope	nominal
Domestic Manila Rope	6.25 / —
Jute Carpet Threads	6.00 / —
Bleachery Burlap	— / 8.00
Scrap Burlap—	
Foreign	6.50 / 6.75
Domestic	6.50 / 6.75
South America	6.50 / 6.75
Foreign Wool Tares	7.50 / —
Domestic Wool Tares	7.50 / —
Austr. Wool Pouches	7.50 / —
New Zealand Wool Pouches	5.00 / —
New Burlap Cuttings	7.00 / —
Heavy Baling Bagging	7.00 / 7.50
Paper Mill Bagging	— / 5.00
No. 1 Roofing Bagging	1.75 / —

Domestic Rags (New)

(F.o.b. Boston)

New Light Prints	.07¼/ —
Fancy Percales	.08 / —
White No. 1 Shirt	.11 / .11¾
Light Flannelettes	.08 / .08½
Canton Flannels, Bleached	.10 / .11
Underwear Cutters, Bleached	.11½/ —
Underwear Cutters, Unbleached	.11 / .12
Silesias No. 1	.08 / .08½
Black Silesias	.04½/ —
Red Cotton Cuttings	.05¾/ —
Blue Overalls	— / .08½
Soft Unbleached	.11 / .12
Blue Cheviots	.08 / .08½
Fancy	.06 / —
Washable	.06 / —
Khaki Cuttings	.06½/ .07½
Corduroy	.04 / —
Men's Corduroy	.04 / —
Khaki Canvas	— / .06
B. V. D. Cuttings	.11½/ —

Domestic Rags (Old)

(F.o.b. Boston)

	Per 100 lbs.
No. 1 Whites, Repacked	5.00 / 5.50
No. 1 Whites, Miscellaneous	4.50 / 5.00
No. 2 Whites, Repacked	— / —
No. 2 Whites, Miscellaneous	2.65 / —
Twos and Blues, Repacked	2.75 / —
Old Blue Overalls	4.00 / 4.50
Thirds and Blues, Repacked	2.20 / —
Black Stockings	3.50 / 4.00
No. 1 Roofing Stock	1.70 / —
No. 2 Roofing Stock	1.60 / —
No. 3 Roofing Stock	1.50 / —
No. 4 Roofing Stock	1.50 / —
No. 5, Quality A.	1.60 / —
Old Manila Rope	3.00 / —

Foreign Rags

(F.o.b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F.o.b. Chicago) Mill Prices, Baled

Shavings—	
No. 1 Hard White Envelope cuts, one cut	$100.00/ —
No. 1 Hard White Shavings, unruled	90.00/ —
No. 1 Soft White Shavings	80.00/ —
No. 1 White Ledger	60.00/ —
No. 1 Heavy Books & Magazines	28.00/ 30.00
White Blank News	50.00/ —
Mixed Kraft Env. & Bag Cuttings	70.00/ —
No. 1 Assorted Old Kraft	25.00/ —
Overissue News	22.00/ —
No. 1 News	— / 18.00
No. 1 Mixed Paper	9.00/ —
Old Corrugated	14.00/ 15.00
Mill Wrappers	11.00/ —

Markets

Blanc Fixe

Supply good; demand steady. Pulp is currently quoted at $85.00 in bags, car lots at works, 6 cents per pound, l.c.l., deld.; by-product $75.00 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder

Demand strong. Supply adequate. Prices firm. Export inquiry good. Prices range from $4.25 to $4.75 per 100 pound drums, l.c.l. works.

Casein

Demand continues light. Argentine market strengthened by foreign demand. Domestic prices firm, supply light. Current prices on processed acid precipitated casein at 28½ to 32 cents per pound for domestic grades and 25¾ to 27 cents for imported grades, f.o.b. shipping point.

Caustic Soda

Liquid types in easier supply. Dry types continue short. Solid caustic is reported at $3.10 per cwt.; flaked and ground is quoted at $3.50 per cwt. in 400 pound drums, $4 to $4.25 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.60 per cwt.; liquid 73 percent in tank cars at $2.60 per at works.

China Clay

Demand steady. Supply excellent. Domestic filled clay is $9 to $11.50 per ton, car lots; coating clay is $14 to $22. Imported clay quotation, short tons, $16 to $35, export warehouse.

Chlorine

Supply approximately in balance. Shortage of tankcars hampers delivery. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt., in multi-tank cars, f.o.b., works.

Rosin

Prices rising as supply outside loan lessens. Buying improves. Export buying awaits ECA dollars. Gum rosin in drums per 100 pounds net in car lots, f.o.b., Savannah; B, $6.50; G, H, I, K, $7.50. Wood rosin per 100 pounds net, car lots, f.o.b. Savannah; B, $5.00; FF, $6.50.

Rosin Size

Heavy demand. Supply good. Seventy percent gum and pale wood grades, tank cars, $6.30 to $6.40, f.o.b. southern shipping point.

Salt Cake

Heavy kraft production keeps demand ahead of supply. Production under contract. Domestic salt cake quoted at $25 to $28.

Soda Ash

Supply continues to improve. Deliveries up to schedule. Production gains shown. Current prices, car lots per 100 pounds; in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

Sodium Bicarbonate

Demand eased by better supply of other alkalis. Production good. Reported as $1.93 per cwt. paper bags, carload lots.

Starch, Corn

Prices steady. Supply good. Demand moderate. Record crop forecast. Pearl grade quoted at $6.41 per 100 pounds; powdered starch at $6.52 to $6.56 per 100 pounds; car lots, New York.

Starch, Potato

Supply ample wtih heavy crop forecast. Inquiry good. Prices lower. High grade quoted at $5.60 cwt. f.o.b. Idaho, $6.25 f.o.b. Aroostook; Pearl grade $6.10 cwt. f.o.b. Aroostook.

Sulphate of Alumina

Demand increased. Supply steady. The commercial grades are quoted from $1.50 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

Sulphur

Demand active. Supplies steady. Production shows heavy gain. Annual contracts are quoted at $16 to $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $17.50 to $19.50 per long ton.

Talc

Prices steady. Demand continues far in excess of supply. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in car lots.

Tapioca Flour

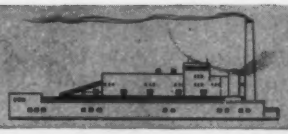
High grades in fair supply and demand. Superior highs range from $10.25/$11.00 cwt.; medium grades $9.25 cwt., on dock Atlantic and Gulf ports; low grades range from $7.25/$7.50 cwt., on dock N. Y. Medium and low grades in adequate supply.

Titanium Dioxide

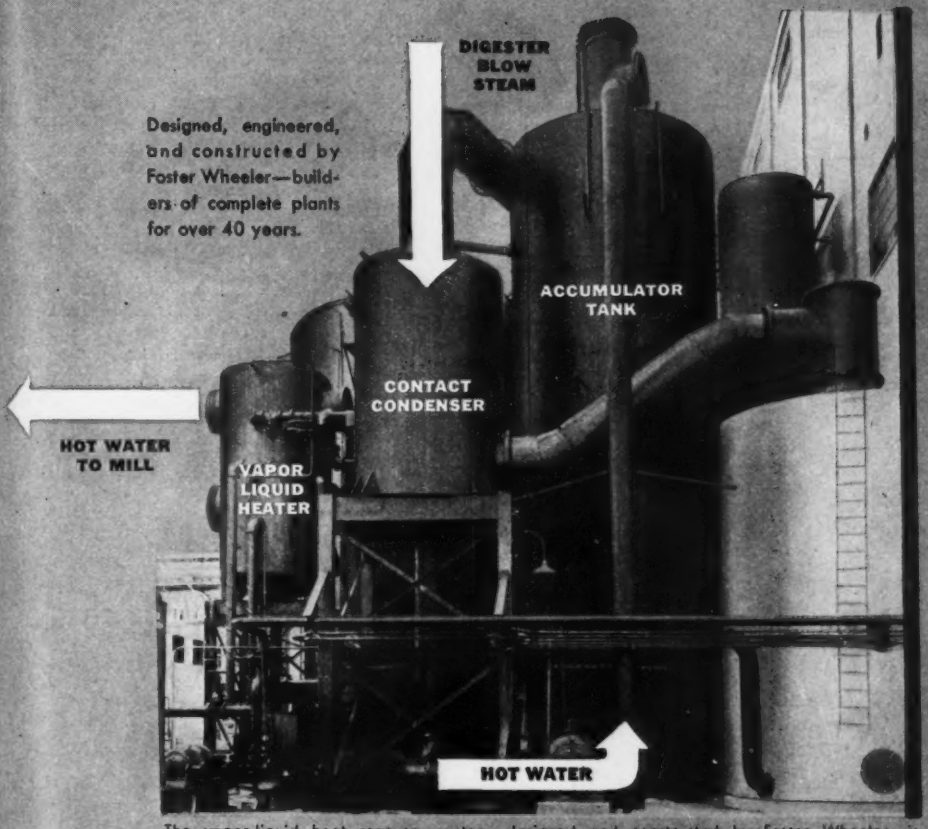
Supply of paper grades continues unequal to demand. Shipments on allocation. Anastase 18c pound carload lots, 18½-19c l.c.l., rutile, 20c pound carload lots, 20½-21c l.c.l.; 50-pound bags, f.o.b. plant, minimum freight allowance.

Digester Blow Heat Recovery

For Pulp Mills



Designed, engineered, and constructed by Foster Wheeler—builders of complete plants for over 40 years.



The vapor-liquid heat recovery system, designed and constructed by Foster Wheeler, is installed in a southern sulfate mill and serves seven 3,150 cubic-foot digesters at an annual saving of $40,800; the unit paid for itself in less than eight months time.

Units Pay For Themselves

Foster Wheeler builds surface condenser and vapor-liquid digester heat recovery systems which, according to performance records, pay for themselves within twelve months.

The recovery of heat is of paramount importance for economical pulp mill operation. Foster Wheeler engineers will be glad to study your particular problem and recommend the type of equipment which will give optimum service.

For further information, write . . .

FOSTER WHEELER CORPORATION, 165 BROADWAY, NEW YORK 6, N. Y.

FOSTER WHEELER

Financial Record

	Per Share Calendar Year 1947	Earnings 12 Mos. to Approx. 6/30/48	Indic. Annual Divid. Rate	Oct. 13 Closing Market Price
Preferred Stocks				
Armstrong Cork Co. $3.75 Cum.	$38.64*	$43.53*	$3.75	93½
Armstrong Cork Co. $4.00 Cum. Conv.	38.64*	43.53*	4.00	109⅜
Celotex Corp. 5% Cum.	24.25c	26.25g	1.00	
Champion Paper & Fibre $4.50 Cum.	65.90f		4.50	
Container Corp. of Amer. 4% Cum.	102.74	88.25	4.00	
Crown Zellerbach $4.20 Cum.	56.40f	55.07g	4.20	
Crown Zellerbach $4.00 Cum. Conv. 2nd	211.39f	217.70g	4.00	
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	9.16	8.59	2.50	47½
Flintkote Co. $4 Cum.	81.91	80.04	4.00	
Robert Gair Co. Inc. 6% Cum.	18.01	16.26	1.20	17½
International Paper Co. $4 Cum.	236.51	245.85	4.00	
Johns-Manville $3.50 Cum.	128.81	134.48	3.50	107½
Kimberly Clark Corp. 4½% Cum.	70.03	73.34	4.50	
Kimberly Clark Corp. 4% Cum. Conv. 2nd	95.88	100.73	4.00	
MacAndrews & Forbes 6% Cum.	62.20	62.56	6.00	
Mead Corp. 4¼% Cum.	81.56	79.68	4.25	
Mead Corp. 4% Cum. Conv. 2nd	53.34	51.75	2.00	
Paraffine Cos. Inc. 4% Cum. Conv.	152.76a		4.00	
Rayonier Inc. $2 Cum.	13.58	15.44	2.00	
St. Regis Paper Co. 4.40% 1st A	76.93	84.43	4.40	
Scott Paper Co. $3.40 Cum.	43.95	50.24	3.40	89
U. S. Gypsum Co. 7% Cum.	211.34	362.32	7.00	169
United Wallpaper Inc. 4% Cum. Conv.	(d)1.35a		2.00	
West Virginia Pulp & Paper 4½% Cum.	75.75c	78.49g	4.50	
Common Stocks				
APW Products Co.	$1.24	$1.46	$0.25	5
American Writing Paper Corp.	1.61	.47	0.25	5⅝
Armstrong Cork Co.	6.41	7.17	2.60	52½
Celotex Corp.	6.59c	7.15g	2.00	27⅛
Certain-Teed Prods. Corp.	3.75	3.92	0.90	14½
Champion Paper & Fibre	5.57f		2.00	24
Congoleum Nairn Co.	4.55	5.12	2.00	34¼
Container Corp. of America	10.09	8.50	2.00e	37¼
Crown Zellerbach	5.81f	6.53g	2.00	29⅛
Dixie Cup Co.	5.87	5.37	1.00	
Flintkote Co.	6.27	5.83	2.50	32¾
Robert Gair Co. Inc.	2.83	2.59	0.40	7⅛
Great Northern Paper Co.	4.56	4.44	2.40	37
International Paper C	15.02	15.62	4.50	59¾
Johns-Manville Corp.	3.17	3.28	1.40	38½
Kimberly-Clark Corp.	4.29	4.52	1.40	20⅜
MacAndrews & Forbes Co.	3.68	3.70	2.50	
Marathon Corp.	3.39c	3.93g	1.40	23½
Mead Corp.	7.33	7.10	2.00	18⅛
National Container Corp.	4.13	3.11	1.20	10¾
Paraffine Cos. Inc.	2.40a		1.20	23
Rayonier, Inc.	7.30	8.47	2.00	31⅞
Ruberoid Co.	10.88	12.13	2.75	61½
St. Regis Paper Co.	2.66	2.87	0.60e	11
Scott Paper Co.	3.02	3.49	2.20	47½
Sutherland Paper Co.	6.87	6.56	2.50	
Taggart Corp.	1.29		0.60	11½
Union Bag & Paper Corp.	7.93	8.35	3.00	33⅞
United Board & Carton	4.95b	3.39h	1.00	
U. S. Gypsum Co.	10.00	12.49	6.00	99
United Wallpaper	(d)0.11a		—	3⅞
West Virginia Pulp & Paper	11.40c	11.56g	4.00	44

(a) Year ended 6/30/48
(b) Year ended 5/30/48
(c) Year ended 10/31/47
(d) Deficit
(e) Plus extras
(f) Year ended 4/30/48
(g) 12 months to approximately 7/31/48
(h) 12 months to 8/21/48
(*) Pro forma

Dividends Declared

British Columbia Pulp & Paper Co.'s dividend payment of $28 scheduled for November 1 on $101.50 arrears on its 7 percent $100-par preferred stock indicates the upward trend of earnings in recent years. Apparently, operating costs are going down, due to improvements in plant and equipment and this is helping to provide funds for liquidating preferred arrears of the company.

Bathurst Power & Paper Co. Ltd. reported operating profit of $918,271 for the three months ended June 30, against $980,893 for like period of 1947. Net income reached the best level in the company's history as a result of a substantial reduction in the estimated amount payable in income taxes. Operating profit for the year's first six months was reported at $1,750,548 against $1,650,941 in 1947, with net income at $900,433 compared with $755,290 for 1947's period. Net profit for the six months was equivalent to $2.25 per share of "A" stock or $1.71 per "A" share and 71 cents per "B" share on a participating basis; while net for the 1947 period worked out to $1.88 per "A" share or $1.51 and 51 cents per "A" and "B" share participating. Net working capital which almost doubled to $7,510,107, largely as the result of the sale of $3,500,000 in first mortgage bonds during the first quarter, showed further improvement in the second three-months period, amounting to $7,794,816, June 30, 1948.

United Wallpaper, Inc. reported net loss of $52,163 for the year ended June 30, contrasted with net income of $1,842,345 and $1.46 per common share for the preceding fiscal year. Net sales for the period amounted to $11,613,250 against $22,760,582. Factors which were held as contributing to the sharp decrease in sales and net loss were excessive distributors' inventories and increased costs.

Rayonier Inc. on Sept. 29, declared an increased regular dividend for the fourth quarter of 1948 in the amount of 50 cents per share of common stock payable Nov. 15, to stockholders of record Oct. 29. Previous rate was 25 cents per quarter.

West Virginia Pulp & Paper Co. voted a year-end extra dividend of $2.00 per common share payable Oct. 15, thus bringing total for the fiscal year ending Oct. 31 to $4.00, $1.00 more than disbursements of the previous year.

Crystal Tissue Co. declared a regular quarterly dividend of 15 cents per common share payable Sept. 30 to shareholders of record Sept. 20.

Celotex Corp. declared quarterly dividend of 50 cents per common share payable Oct. 30 to holders of record Oct. 8.

New Paper Issue

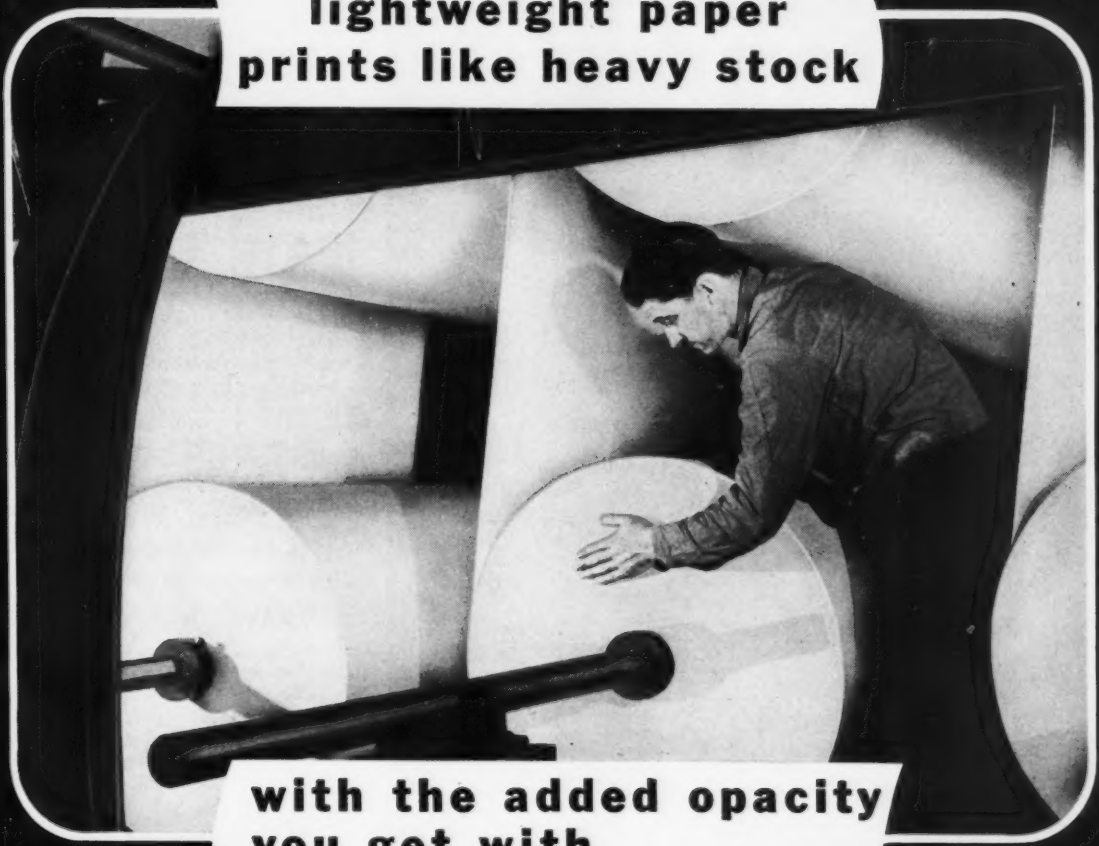
TORONTO—Offering is reported being made of 24,993 $20 par value 5½ percent cumulative preferred shares of Shaw-Manson Ltd., Montreal.

Shares are being offered by company itself at par with purchasers receiving a commission of 95 cents a share and the option of buying 1 common for each preferred at a price of $1 a share for the former.

Payment can be made on basis of ten percent on application; ten percent on allotment; and balance at call of directors.

TITANOX . . . *the brightest name in titanium pigments*

lightweight paper prints like heavy stock



with the added opacity you get with TITANOX pigments

Paper makers everywhere find that TITANOX pigments add great opacity to their products. Even lightweight stocks take on an opacity usually found only in heavier paper . . . an important advantage that eliminates troublesome "show-through" in printing. There is a specific TITANOX pigment to meet the particular requirements of any paper — at the same time imparting the high whiteness and brightness for which these titanium dioxide pigments are famous.

Our Technical Service Laboratories are available to help you solve any pigmentation problems. We invite your inquiries.

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Producers of

SULPHUR

Large stocks at our mines make possible prompt shipments

Uniformly high purity of 99½% or better

Free of arsenic, selenium and tellurium

TEXAS GULF SULPHUR CO. INC.

75 East 45th St. New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas

18th Power Show

(Continued from page 11)

cost and with fewer difficulties in maintaining uniform head pressure at the minimum. In the same display will be condensers and heat exchangers especially designed to conserve cooling water.

Special equipment displays also include a line of metering pumps designed to handle relatively small quantities of fluids in processing, and which have applications in such varied fields as textiles, cosmetics, petroleum and petro-chemicals, brush manufacture, rubber, paints and varnishes, cement, pulp and paper, laundry, metal plating and others. Another line of pumps, gears and machine parts, will be pointed up by the display of a screw pump handling corn syrup with no pulsation or leakage at packing glands.

A manufacturer of stationary compressors in various sizes, has developed the packaged unit idea and has combined on a single foundation and frame, compressor with built-in motor drive, overhead tank and radiator cooling.

Material Handling Equipment

A lift truck is now available with grab arms which eliminate the need for pallets in handling bales, boxes, bundles, bags, barrels and drums. There is also a new truck especially designed for handling rolls of paper and other cylindrical loads, while at another booth is a line of hand and power lift trucks, including a portable elevator, which has been improved in a number of points since the last exposition.

Fine Machine Tools

Interesting examples of fine machine tooling will also be exhibited. Among them is a surface grinder measuring only 6 x 12 inches by 15 inches high, which it is claimed will grind gauge blocks to a mirror finish and fair "ringability." Along with it there will be a plain grinder said to be capable of producing less than one microinch surface finish in sapphire, carboloy and high speed steel. There will also be on view a seven-inch precision bench shaper which is new and a ten-inch tool room bench lathe. A display of multiple drilling and tapping machines in operation, a new line of woodworking tools incorporating many advancements, and a line of radial saws are other notable features of the display.

This year's advisory committee consists of the following: Chairman, I. E. Moultrop, consulting engineer of Boston. John H. Lawrence, consulting engineer, is vice chairman.

Others are: Comfort A. Adams, E. G. Budd Mfg. Co.: Homer Addams, past president, American Society of

(Continued on page 44)

If it's anything in piping...
CRANE has everything you need

Take This Boiler Feed and Condensate System, for example. Notice how the broad Crane line meets every piping requirement. Regardless of fluids to be handled, you'll find—in **One Catalog**—the world's most complete selection of valves, fittings, accessories, fabricated piping and pipe. **One Order** to your local Crane Branch or Wholesaler covers everything you need in brass, iron, steel, and corrosion-resistant materials.

Use this **One Source of Supply** to simplify all piping procedures, from design to erection to maintenance. **One Responsibility** for all piping equipment delivered to the job helps assure better installation, avoids needless delays. **High Quality** in each item from Crane assures high efficiency and dependability in every part of piping systems.

Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
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RESPONSIBILITY
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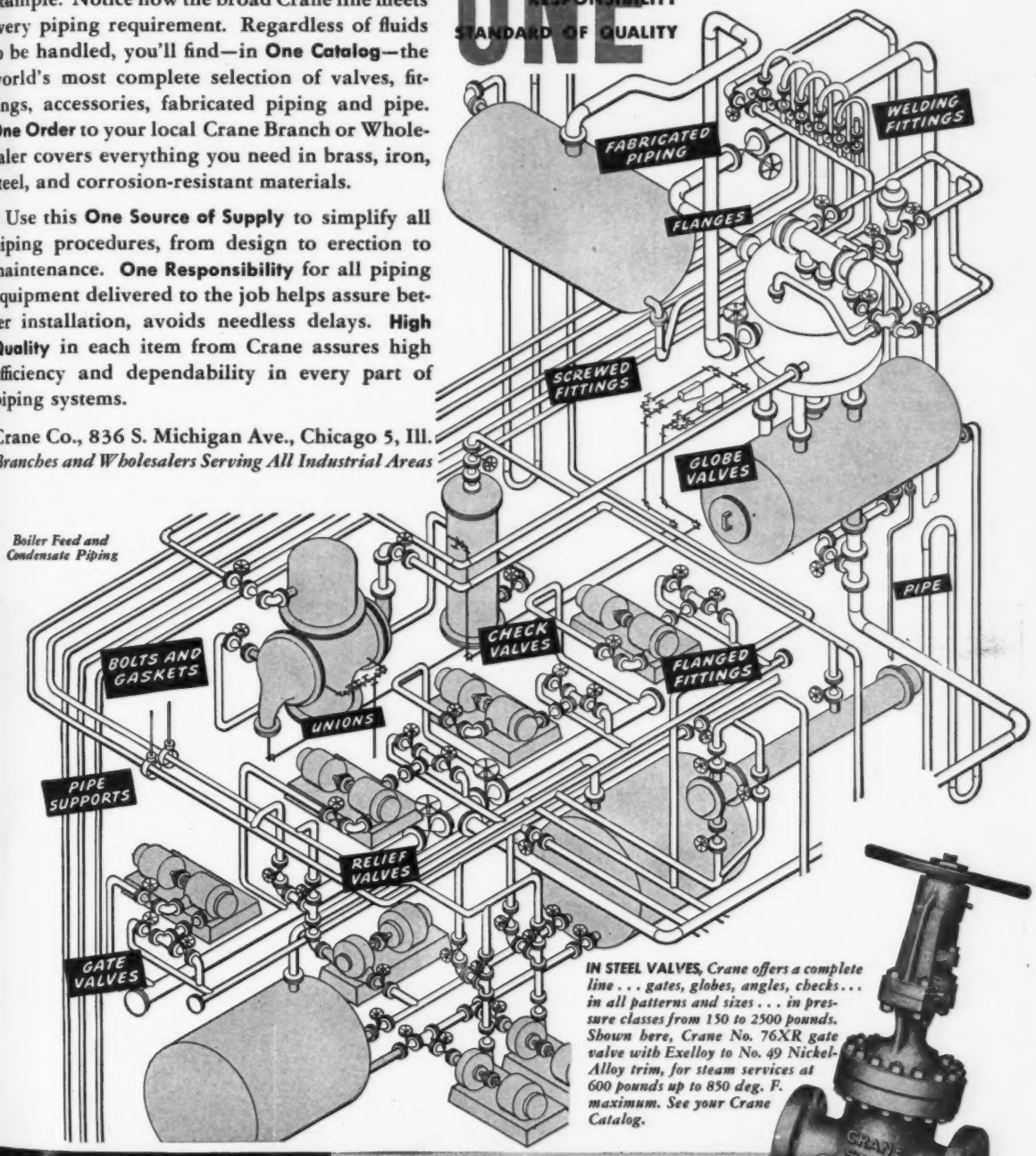


Boiler Feed and Condensate Piping

IN STEEL VALVES, *Crane offers a complete line . . . gates, globes, angles, checks . . . in all patterns and sizes . . . in pressure classes from 150 to 2500 pounds. Shown here, Crane No. 76XR gate valve with Exelloy to No. 49 Nickel-Alloy trim, for steam services at 600 pounds up to 850 deg. F. maximum. See your Crane Catalog.*

EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM

18th Power Show

(Continued from page 42)

Heating & Ventilating Engineers; J. T. Barron, vice-president electric operation, Public Service Electric & Gas Co.; R. E. Dillon, vice-president production and engineering, Boston Edison Co.; A. C. Fieldner, chief, fuels and explosives branch, U. S. Bureau of Mines; N. E. Funk, vice-president engineering, Philadelphia Electric Co.; Clifford F. Holske, president, American Society of Refrigerating Engineers; David Moffat Myers, consulting engineer; Joseph Pope, vice-president, Stone & Webster Engineering Corp.; Charles F. Roth, manager of the Exposition; A. Bowman Snavely, chief engineer, Hershey Chocolate Corp.; E. K. Stevens, associate manager of the Exposition; G. L. Tuve, president, American Society of Heating & Ventilating Engineers; Alfred Vaksdal, plant engineer, Corning Glass Works; Horace W. Wilds, past-national president, National Ass'n. of Power Engineers, and others.

The exposition opens Monday, November 29, at 2 p.m. and will be open daily thereafter from 11 a.m. to 10 p.m., except Wednesday and Saturday, when the closing hour will be 6 p.m. Admission will be by invitation and registration only. The public will be excluded. The exposition is under the management of the International Exposition Co. Charles F. Roth is manager; E. K. Stevens, associate manager.

AMERICAN PAPER AND PULP ASSOCIATION'S PRODUCTION RATIO REPORT*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1948		Corresponding Weeks—1947	
August 28	95.2	August 30	104.1
September 4	94.0	September 6	84.7
September 11	77.4	September 13	106.9
September 18	97.3	September 20	108.6
September 25 (Revised)	98.4	September 27	107.0
October 2	**99.6	October 4	109.5

COMPARATIVE MONTHLY SUMMARIES

1947						1948	
Jan.	102.1	May	106.2	Oct.	109.5	Jan.	100.3
Feb.	105.9	June	106.2	Nov.	109.3	Feb.	99.8
Mar.	106.1	July	93.5	Dec.	101.5	Mar.	100.8
Apr.	105.1	Aug.	104.2			Apr.	100.8
		Sept.	102.0	Year Avg.	104.3	May	100.5
						June	‡94.5
						July	‡88.1
						Aug.	‡96.8
						Sept.	‡91.8

‡ Preliminary Ratios.

COMPARATIVE YEARLY SUMMARIES

	1941	1942	1943	1944	1945	1946	1947	1948
Year to Date	95.4	92.0	88.2	88.0	88.4	100.6	103.7	96.9
Year Average	97.4	90.4	87.8	88.1	89.4	101.1	104.3	

** Indicates 1948 volume of 179,083 tons—Comparable week 1947—173,539 tons.

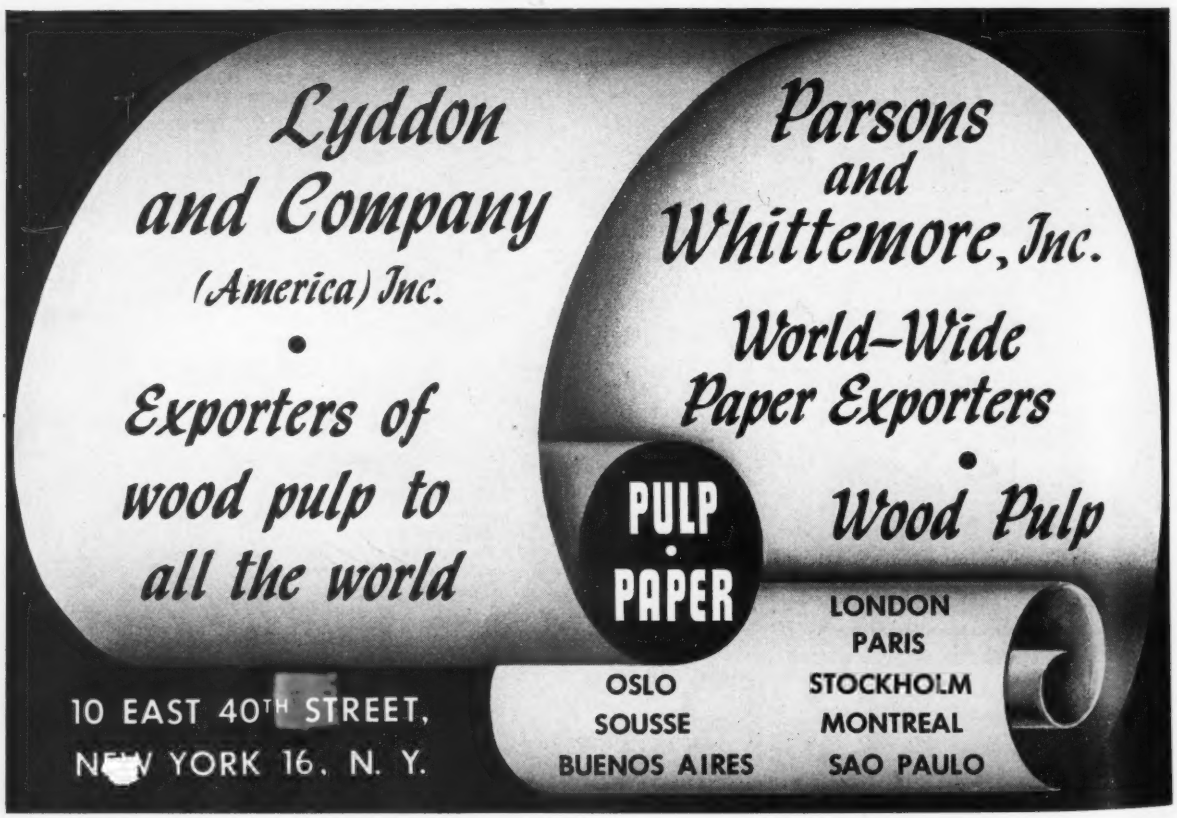
PAPERBOARD OPERATING RATIOS†

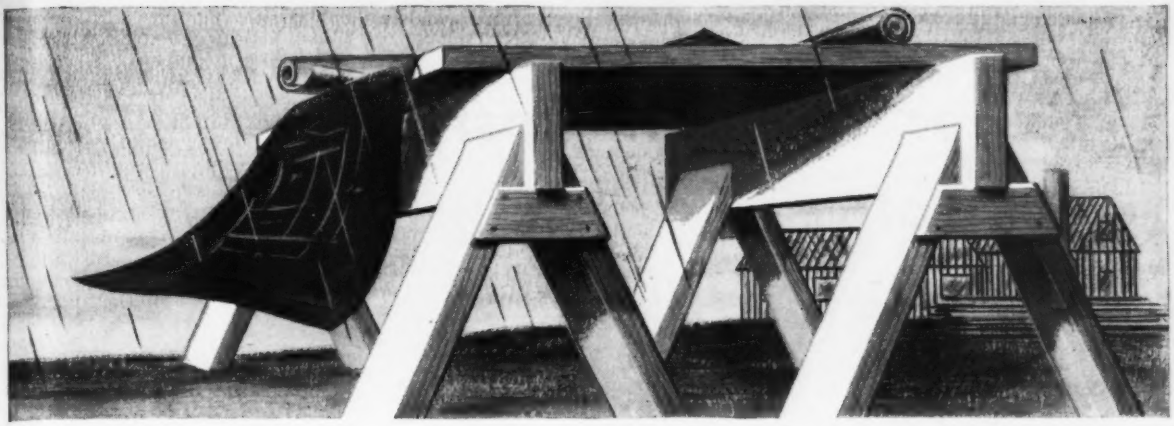
Current Weeks—1948		Corresponding Weeks—1947	
August 28	93	August 30	99
September 4	91	September 6	79
September 11	76	September 13	103
September 18	97	September 20	101
September 25	94	September 27	102
October 2	96	October 4	100

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1947	99	103	101	100	101	101	90	99	96	101	99	89	98
1948	99	100	102	102	100	94	81	92	91				

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.





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for stability and
range of application

P-426 → BECKAMINE

the quick-curing wet strength resin

P-426 Beckamine imparts exceptional wet strength to many kinds of pulp, processed for a wide variety of end uses. It can be applied in beater, fan pump, head box or directly to the sheet at the size press. It cures quickly—between 60% and 80% of total wet strength will be realized as the paper comes off the drier. And it is exceptionally stable in storage. From every paper making standpoint it is the resin of choice. Write direct to the Sales Department at Detroit for further information.

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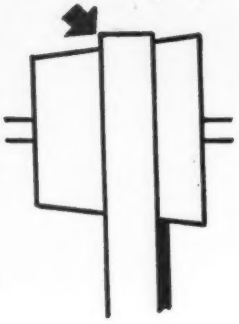
SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • INDUSTRIAL CHEMICALS

Lower the Belt Cost per Ton of Paper produced, with

Power loss caused by failure of ordinary belt to conform to pulley.



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3-PLY LEATHER BELT

scientifically constructed for cone-pulley drives, where the greatest stress on the belt is in a diagonal rather than a straight line.

Sometimes even good belts of ordinary construction cannot stand up under this excessive stress and belt life is greatly shortened.

FLEXOCONE is specifically designed and constructed to meet and overcome these conditions which are always present on a cone-pulley drive.

★ Experienced Alexander engineers will gladly specify FLEXOCONE belts to meet the particular conditions of your drives. Send for specification sheets.

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Maximum power obtained with FLEXOCONE.

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Obituary

William R. Bulger, 49, president of the Great Lakes Paper Stock Co., Buffalo, N.Y., died on September 28 in Buffalo General Hospital. He had been in ill-health for eight years. Mr. Bulger was a member of the Buffalo Athletic Club, Buffalo Canoe Club and Phi Delta Phi, law fraternity. Surviving him are his widow, the former Marie E. Irr; his parents, Robert J. and Laura C. Labby Bulger; and two sisters, Mrs. Wm. O. Dillingham and Mrs. Darrell C. Fisher.

Percy D. Wyman, 58, of Belmont, Mass., general manager of Ralph F. Bass, Inc., Boston, Mass., a leading figure in the New England paper and cordage industry as a technical expert, more especially in the cordage field, died on September 25. With the company for 11 years as general manager, he was widely known in the trade. Mr. Wyman had been ill for approximately eight weeks. Surviving are his widow, three daughters and one son.

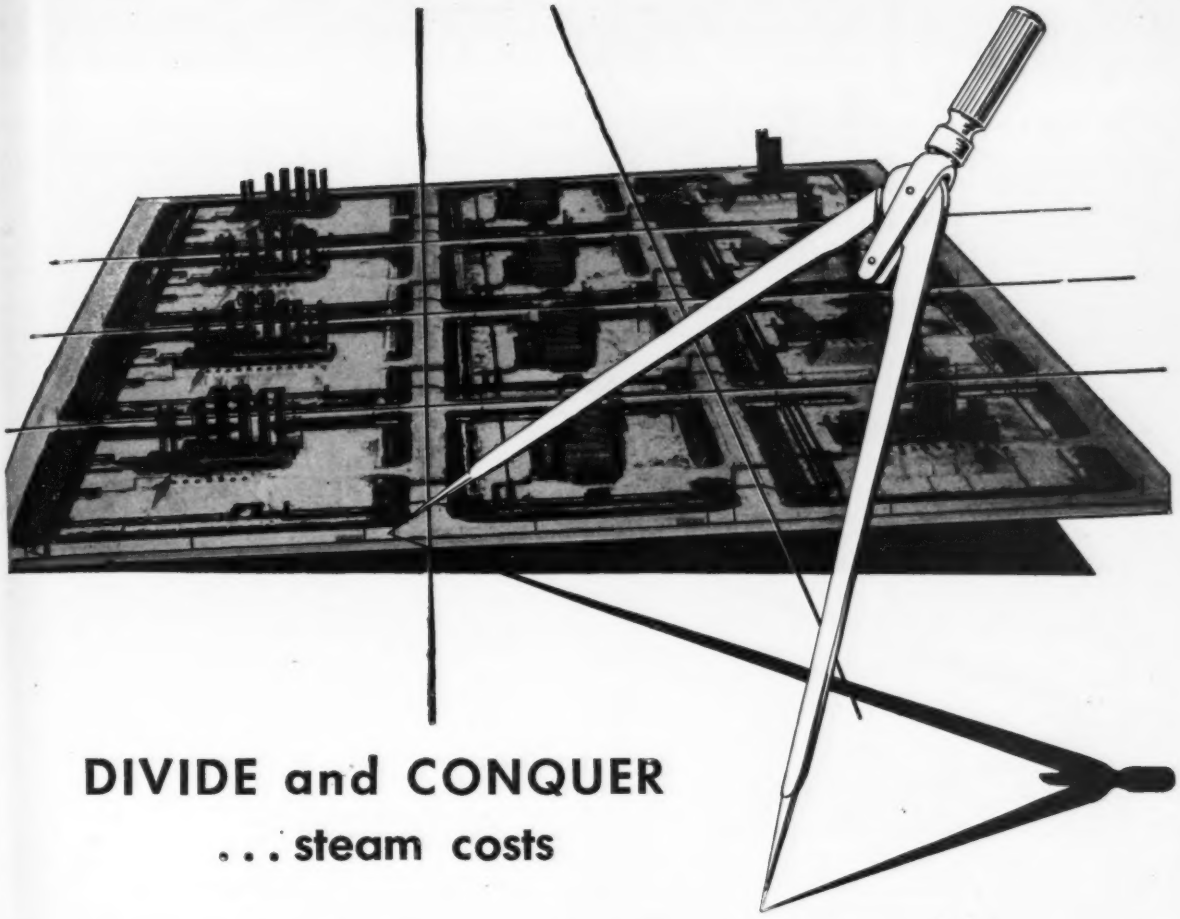
L'Hommedieu Eggleston, 89, former owner of the Johnston & Eggleston wholesale paper business which he and the late John M. Johnston founded in Buffalo, N.Y., in 1911, died in Sisters Hospital on October 3, following an illness of several months duration. Mr. Eggleston retired from business in 1943.

B. W. Simon, 57, president of the Albany Paper Co., Albany, Ga., died on October 1, following a prolonged illness. Surviving Mr. Simon are his widow; three daughters, Mrs. M. I. Lowe, Mrs. A. E. Moncrief and Mrs. R. J. Alverson; three sisters and a brother.

Supts' 1949 Convention

NEW YORK — The National Convention of the American Pulp and Paper Mill Superintendents Ass'n. will be held June 15-17, 1949, at Hotel Haddon Hall, Atlantic City, N.J., Ollie W. Messner, president of the Association, reports.

According to George W. Craigie, secretary-treasurer of the Superintendents Ass'n., persons desiring to make reservations for the convention can do so immediately by communicating directly with the management of the Haddon Hall Hotel. Mr. Craigie reports that there should be sufficient rooms in the Haddon Hall and Chalfonte hotels for all of the superintendents and allied industry representatives who wish to attend this national meeting. He suggests that all reservations be made on the American plan.



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Coming Up

ASSOCIATION EXECUTIVES: Please send us your meeting dates and locations for this column as far in advance as possible. No charge for publication.

OCTOBER 12-16: Fifth National Chemical Exposition. Coliseum, Chicago, Ill. For details, write to Marcus W. Hinson, manager, care of Chicago Section, American Chemical Society, 1505 South Wabash Avenue, Chicago 5.

OCTOBER 13: American Society for Testing Materials, Philadelphia District. Franklin Institute.

OCTOBER 14: American Society for Testing Materials, Washington, D. C., District. Wardman Park Hotel.

OCTOBER 14-15: American Society of Mechanical Engineers, Wood Industries Division Conference, Hotel Sheraton. High Point, N. C. O. B. Schier, II, meetings and divisions manager.

OCTOBER 19: American Society for Testing Materials, Chicago District. Joint meeting with Western Society of Engineers.

OCTOBER 21-23: Joint Meeting, Southern and Southeastern Superintendents Divisions. Biltmore Hotel, Atlanta, Ga.

OCTOBER 25-28: Third Engineering Conference of the Pulp and Paper Industry sponsored by TAPPI. Statler Hotel and Westinghouse Electric Co., Auditorium, Buffalo, N. Y.

OCTOBER 26: American Society for Testing Materials, New York District. Engineering Societies Building.

OCTOBER 26-27: Office Management Conference, American Management Ass'n. Hotel Pennsylvania, New York.

OCTOBER 28-30: National Paper Trade Ass'n. Fall Convention. Stevens Hotel, Chicago, Ill. For details write to Arthur H. Chamberlain, 220 East Forty-Second Street, New York 17, N. Y.

NOVEMBER 4: American Society for Testing Materials, St. Louis District. Joint meeting with St. Louis Chapter, American Society for Metals. Engineers Club.

NOVEMBER 4-5: Third Midwest Conference, American Society for Quality Control, Hotel Sherman, Chicago. For details, write to E. H. Robinson, Chairman, Publicity Committee, P. O. Box 1097, Chicago, Ill.

NOVEMBER 10: American Society for Testing Materials, Philadelphia District. Franklin Institute.

NOVEMBER 16: American Society for Testing Materials, Cleveland District. Cleveland Engineering Society.

NOVEMBER 18-19: Production Conference, American Management Ass'n. Hotel Drake, Chicago.

NOVEMBER 19: American Society for Testing Materials, New England District. Hotel Sheraton, Worcester, Mass.

NOVEMBER 29: American Society for Testing Materials, Pittsburgh District, Mellon Institute.

DECEMBER 2-3: Insurance Conference, American Management Ass'n. Hotel Drake, Chicago.

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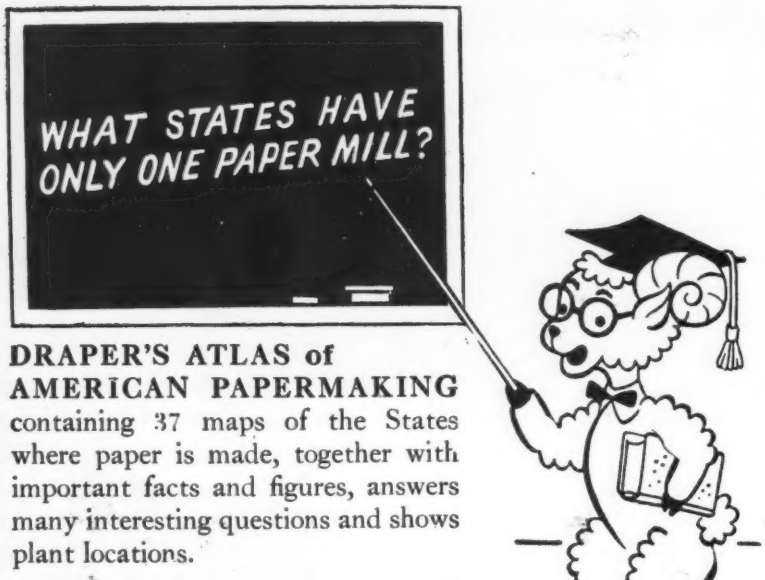

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VICTORIA NAMES HOLL

W. H. HOLL, now production manager of the Victoria Paper Mills Co., Fulton, N. Y., comes to that post from 18 years of service with the Scott Paper Co., Chester, Pa.

Answer to Question No. 10 — Rhode Island, Colorado, Arizona

Pan Level and Temperature Control on Paper Coating Machines

By H. A. SHOLL and E. A. MURPHY
Brown Instrument Co., Philadelphia, Pa.

Automatic control of both the level and temperature of the mixture in the pan is frequently responsible for increases in the efficiency of the coating operation and the quality of the finished product.

In any coating operation, uniform application of the coating mixture to the paper sheet is a primary requisite and is largely influenced by both the level and temperature of the mixture in the pan. Level, of course, is of particular significance in the operation of machine coaters and other types of brush and roll coaters because it influences the amount of coating mixture picked up and applied to the sheet. Temperature is of importance on all coaters since too low a temperature produces undesirable changes in mixture viscosity, while excessive temperature can often destroy the adhesive qualities as well as certain dyes used in some coating mixtures.

Level Control

In various types of roll and brush coaters employed, uniform distribution of the coating mixture is virtually impossible unless pan level is held constant. Although many coaters make use of continuous mixture recirculation, relying upon an overflow pipe to maintain the proper pan level, there are cases where continuous recirculation is undesirable.

The electrode type level controller shown in Fig. 1 offers a simple method of insuring correct pan level on coaters not employing continuous recirculation. This controller, which has not been utilized to the greatest advantage in the paper industry, will provide highly satisfactory level control on applications where neither indication nor record of the level is required.

Consisting of a pair of stainless steel electrodes, a detecting relay, an electric-pneumatic relay, a diaphragm motor operated valve, and, when desired, a signal light, the system utilizes a circuit wherein action of the control valve is determined by the flow of a small electric current through the coating mixture.

The detecting and electric-pneumatic relays are supplied with 110-volt line current, while a low voltage detecting current is applied to the electrodes. Circuit arrangement is such that the coating mixture must make or break contact with both electrodes before control action takes place, a factor which effectively eliminates hunting or chattering of the control valve caused by agitation or turbulence of the mixture within the pan.

The vertical distance between the electrodes (normally from ¼ to ¾ of an inch) is adjusted in the field to compensate for the degree of turbulence present. Requiring little space in the coating pan, the electrodes can be located so that they will not interfere with threading of the paper or cleaning of the tray. Maintenance consists only of occasional removal of built-up or deposited coating mixture and requires only a few minutes.

A signal light, offered as optional equipment, is often installed to indicate operation of the control system.

Operation of Level Control System

When the system is started up, with the pan empty, the electrical circuit between the electrodes is not completed. Under these conditions the normally closed contacts of the detecting relay supply line voltage to the

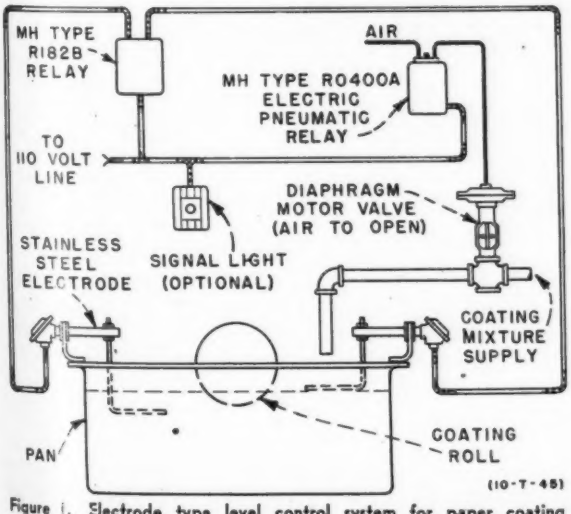
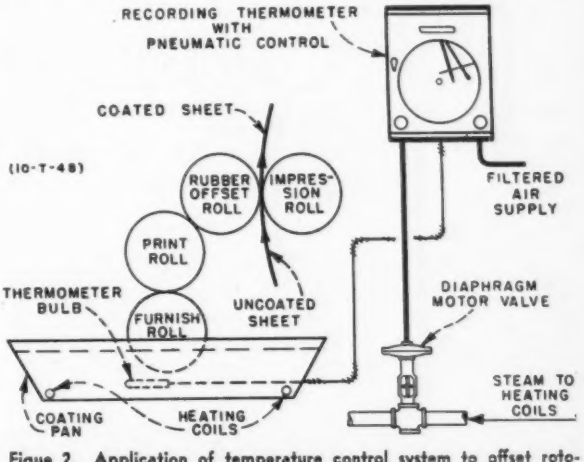


Figure 1. Electrode type level control system for paper coating machine.



Figue 2. Application of temperature control system to offset rotogravure print coater.

electric-pneumatic relay which admits air to the diaphragm motor valve causing this valve to open and allow coating mixture to flow into the pan.

Upon reaching the upper electrode, the mixture completes the electrical circuit between electrodes; the contacts within the detecting relay open, de-energizing the electric-pneumatic relay; and the latter exhausts air from the diaphragm motor valve, allowing the valve to close. This is all done practically instantaneously.

The signal light (if used) is energized whenever the diaphragm motor valve is open, indicating a flow of coating mixture to the pan.

Although described above as applied specifically to a coater, the electrode type of liquid level controller provides a simple and inexpensive method of automatically maintaining any electrically conductive liquid at a desired level when neither indication nor record is required, and when on-off rather than proportional control is satisfactory. In addition to operating a diaphragm motor valve, the controller is capable of starting and stopping pump motors and actuating audible or visual alarms.

Temperature Control

Because of the variety of chemical compounds normally present in coating mixtures, these mixtures are particularly susceptible to lump formation and changes in viscosity of the temperature is not maintained at the proper level. While, at first glance, it may seem that this problem can be most easily solved by guarding only against low temperature, entirely disregarding excessively high temperatures, other factors render such a method of control impractical. As previously mentioned, certain dyes are altered or completely destroyed when subjected to high temperatures.

Where trays are heated by steam coils high temperatures cause the coating mixture to cake up on the coils, lowering the heat transfer rate and resulting in the possibility of lumps breaking off and being carried onto the paper sheet, thus impairing both quality and production.

Although the temperature of the coating mixture is usually controlled automatically in the storage tanks, such control provides no assurance that pan temperatures will remain at the optimum value. Heat losses both in the piping from the storage tank and in the pan itself will result in a pan temperature appreciably below that in the storage tank.

The control system illustrated in Fig. 2 continuously measures and records mixture temperature at the critical point—adjacent to the furnish or pick-up roll—and controls this temperature automatically by regulating the amount of steam admitted to the heating coils. The same system is applicable to control pan temperature on installations utilizing direct steam injection rather than heating coils.

Although indicating controllers, and in some cases non-indicating controllers, are satisfactory, a permanent chart record of the temperature of the mixture is of definite advantage where different coating mixtures are used on various runs of paper. These easily filed records of past performance greatly facilitate setting up the process when the coating mixture is changed.

Operation of Temperature Control System

As shown, the temperature-sensitive bulb is placed near the furnish roll and away from the heating coil or steam pipe. The recording instrument incorporates a pneumatic control unit which provides proportional control action, i.e. causes a movement of the steam valve proportional to the deviation of the mixture temperature from the desired value. This proportional action insures smooth, close control and eliminates the temporary temperature overshoot encountered when on-off control is employed. It also holds mixture dilution to a minimum when direct steam injection is used. Air pressure from the control unit is applied to the diaphragm motor valve controlling steam flow to the pan.

When the temperature of the coating mixture in the pan tends to drop below that established by the adjustment of the instrument set point index, which can be set at the desired value by the operator, the pneumatic control unit immediately increases the transmitted air pressure to the steam valve, thus increasing the flow of steam to the pan, and returning the mixture to the proper temperature. Any tendency of the mixture temperature to increase above the set point is quickly counteracted by reverse control action.

Recent Advances in Zinc Hydrosulphite Bleaching of Groundwood*

By R. R. FERGUSON

Groundwood Superintendent, Pacific Mills, Ltd., Ocean Falls, B. C.

Abstract

Recently the system used by Pacific Mills, Ltd., for the zinc hydrosulphite bleaching of groundwood has been modernized. Previously the method used for bleaching was adapted to the mill system without adding any special equipment. This design was not satisfactory, as the desired increase in brightness was not achieved and caused excessive corrosion. This paper describes the new system which has been installed, together with some contemplated improvements. This made possible the manufacture of newsprint of standard brightness, together with some savings in white water fibre losses.

Development

The development of the zinc hydrosulphite bleaching of groundwood on the West Coast has been described in a previous article by Andrews (1). Groundwoods

* A paper read at the Spring sessions of the Western Branch, Technical Section, Canadian Pulp & Paper Ass'n., Ocean Falls, B. C., May 26-27.
(1) I. H. Andrews, "Zinc Hyposulphite Treatment of Groundwood," *Pulp & Paper Magazine of Canada*, August, 1945, p. 679-881.

produced from Western Woods, especially hemlock, have a naturally lower brightness of around 53 G.E. as compared to that made from Eastern species, which average four to six points higher. In order to manufacture newsprint from Western woods with a brightness desired by the newsprint publishers, the zinc hydrosulphite system has been developed. By this means the required brilliance rise up to six points G.E. is obtained economically and efficiently. If further increases in brightness are desired by the use of zinc hydrosulphite the effectiveness by this method of bleaching drops off rapidly and becomes uneconomical.

Zinc Hydrosulphite Manufacture

At the present time the zinc hydrosulphite solution is made up in 200-gallon batches in a water-cooled stainless steel reaction tank. One hundred and eighty pounds of zinc dust is added to cold water and kept agitated, while sulphur dioxide (purchased in liquid form and stored in ton cylinders) is bubbled through. When the temperature rises above 85° F., sulphur dioxide addition is stopped until the solution cools to 60° F., when it is again turned on. The endpoint is reached when the pH reaches 4.0-4.2 and the specific gravity is between 1.19-1.21. This corresponds to a concentration of 2.2-2.5 pounds of zinc hydrosulphite per Imp. Gal. Manufacturing efficiencies of approximately 90 percent are attained.

After allowing the excess zinc, which is necessary for optimum conversion, to settle, the relatively clear solution is decanted and stored ready for use under a layer of clear mineral oil. The latter prevents deterioration due to oxidization by contact with air.

Plans are being made to manufacture zinc hydrosulphite by a continuous system.

Previous Method

Prior to the new installation in the groundwood mill, the practice was to add the zinc hydrosulphite solution equivalent to two pounds per ton of newsprint direct to the groundwood storage tank ahead of the mixing tanks. The amount of solution had to be limited due to excessive corrosion, especially on the machine wires, caused by residual acids. This in turn kept the brightness value of the newsprint below standard.

Description of Process

In the design and installation of the new bleaching system, advantage was taken of the experience gained by other Pacific Coast mills using similar systems. The main feature which was lacking in the previous system was the installation of circulating retention chests and washers which remove the residual corrosive acids through the system. The groundwood system with the bleaching installations is shown diagramatically in this illustration herewith. This system is designed to bleach 260 A.D. tons of groundwood per day.

Referring to the illustration, there are 21 three-pocket grinders operating at an average of four percent pit consistency and 175° F. temperature. The stock is diluted to 2.5 percent in the stock ditches and flows through the grizzlies. Inclined wooden flumes constructed lengthwise in the bull chests carry the stock to the bull screens. Fitted in the U-shaped area around the flumes are the three retention chambers. A common header connects the accepted stock ports from the three bull screens. Stock from the header is pumped back to the retention chambers where the zinc hydrosulphite solution is added at the suction side of the pump. By this means, intimate mixing is assured. These chambers provide 14 minutes retention time at 2.25 percent consistency. Temperature of the stock averages 135° F. From the retention chambers the stock is pumped to the washers.

The two 8 x 16 Oliver washers use paper mill white water to wash the pulp. Stock enters the vats at 2.25 percent and is discharged at eight percent to the washed stock chest, where it is diluted with decker white water to two percent, and pumped to the knotters. A white water pump connected to the stock pipe line further reduces the consistency to 0.8 percent at the knotters.

From the knotters the stock follows the normal sequence through the screening system to the decker chest.

The washers are equipped with barometric legs having an effective length of 22 feet. Clear and cloudy effluent from the washers is collected in seal boxes below the washers. Warm effluent at 120° F. is mixed with decker white water at 70° F. in the proportions required to maintain a stone shower temperature of 110° F. By this method the corrosive residual is retained in that section of the mill from the grinders to the washers.

Materials Used

To minimize the effect of corrosion, acid-resisting materials are used to handle unwashed stock and washers effluent. Bull screen plates and shafts are constructed of Type 316 stainless steel, while the sprockets and chain are of high chrome alloy. Ryertex is used for bearings and scrapers. Pumps handling unwashed stock and effluent are of acid resisting bronze construction. Pipe lines over four inches in diameter, used for unwashed stock, utilize rubber lined fittings and valves. White water lines carrying effluent are equipped with lithcoted fittings and valves. Smaller pipe lines are constructed of copper with brass fittings.

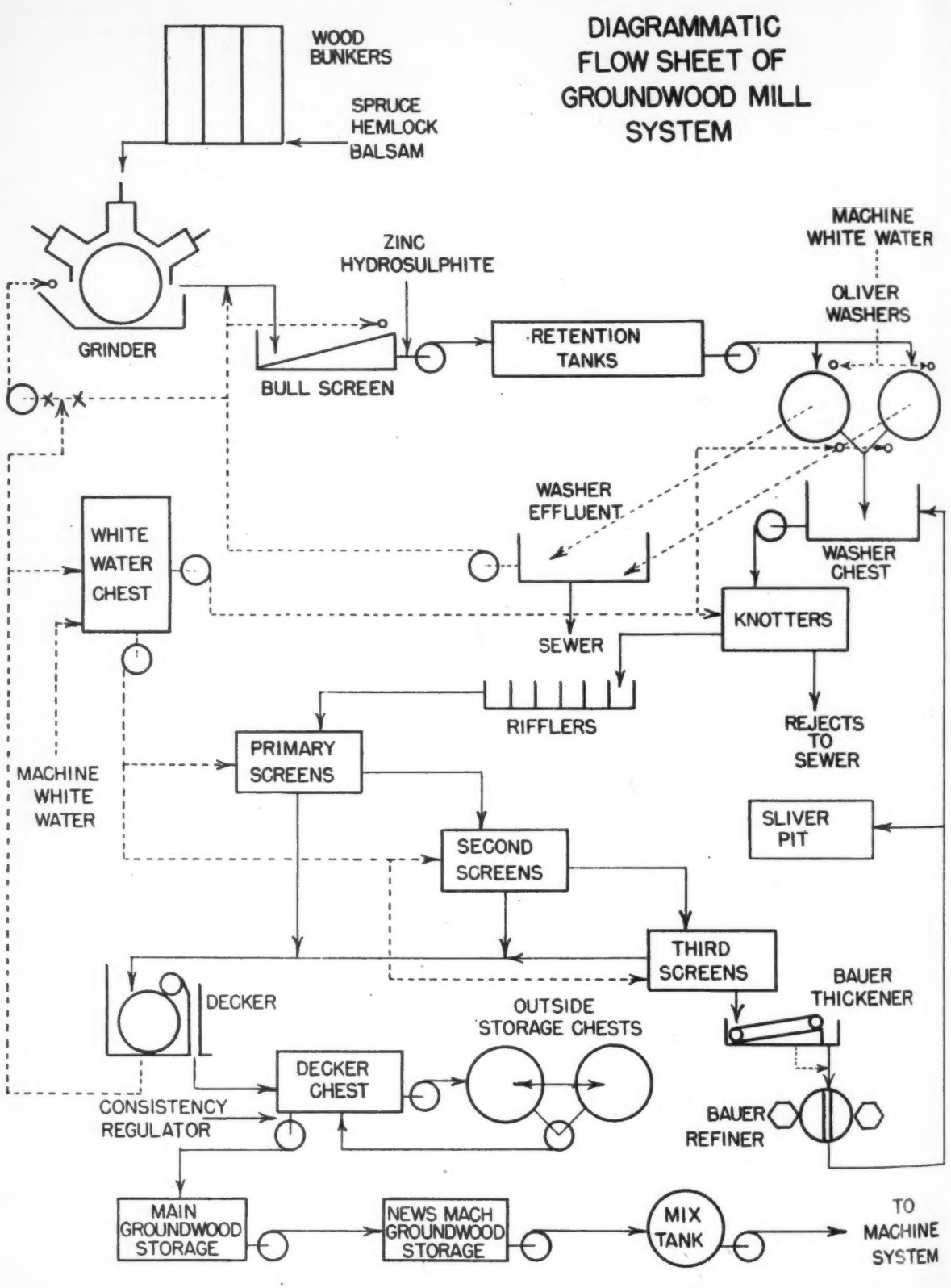
Results

Since the installation of the new system the desired results of manufacturing newsprint with a G.E. brightness of 56 plus has been achieved. Average conditions and results are as follows:

Wood furnished to Groundwood: Spruce, 40 percent; hemlock, 50 percent; balsam, 10 percent; groundwood G.E. brightness, 58-60; newsprint G.E. brightness, 56-57; Zinc Hydrosulphite usage, #/ton newsprint—4.5-6.0.

Recent experiments would indicate that brightness can be maintained with even less hydrosulphite. Usage has been gradually reduced to a low point of 3.9#/ton, while averaging a news brightness of 57. Of course such operation is contingent upon favorable conditions. Spruce yields a naturally brighter pulp than hemlock and the percentage of each species materially affects the brightness of the pulp. Fibre recovery from the paper machine white water also materially affects the brightness. A striking example of the effect of fines is shown in the brightness readings on the two news machines. No. 1 machine, with large table rolls and a higher white water loss, averages one point higher brightness than No. 2 machine with smaller table rolls and a lower loss. A relatively open white water system is certainly desirable from the standpoint of bleaching, if not the overall economy.

The addition of the washers made possible the re-use of more white water from the paper machines. The white water is used to wash the corrosive residuals from


DIAGRAMMATIC FLOW SHEET OF GROUNDWOOD MILL SYSTEM
WOOD BUNKERS
SPRUCE
HEMLOCK
BALSAM
GRINDER
ZINC HYDROSULPHITE
BULL SCREEN
RETENTION TANKS
MACHINE WHITE WATER
OLIVER WASHERS
WASHER EFFLUENT
WASHER CHEST
WHITE WATER CHEST
KNOTTERS
SEWER
RIFFLERS
REJECTS TO SEWER
PRIMARY SCREENS
MACHINE WHITE WATER
SLIVER PIT
SECOND SCREENS
THIRD SCREENS
BAUER THICKENER
DECKER
OUTSIDE STORAGE CHESTS
DECKER CHEST
CONSISTENCY REGULATOR
BAUER REFINER
MAIN GROUNDWOOD STORAGE
NEWS MACH GROUNDWOOD STORAGE
MIX TANK
TO MACHINE SYSTEM

the groundwood and at the same time functions as a saveall recovering fibre from the white water.

No apparent differences have been noted on the amount of slime growth and the value of zinc hydrosulphite as a slimicide has not been as yet determined.

Corrosion

When the bleaching system was first started, routine testing procedure was carried out to measure the extent of corrosion throughout the grinder room. Sodium hydroxide titrations, iodine titrations and pH tests were taken each day. The tests indicated that the mill was operating within a safe range. Observation of the equipment indicated otherwise. Groundwood is naturally corrosive, and parts of the screening equipment were in very poor condition before the hydro-sulphite was introduced into the system. The change-over removed the film of black scab and slime, exposing a clean metal surface. While the chemical tests prove that the mill is in a safe operating range, the pitted and weakened condition of the rotating elements of the screens and white water pumps indicates otherwise. There is no doubt that the rate of corrosion in that part of the mill not protected by acid-resisting materials has increased.

Also, as a further check on the amount of corrosion, the iron content of the newsprint is checked weekly. This ranges from 10-20 p.p.m., which is considered normal and indicates no excessive iron corrosion in the system.

Corrosion could be reduced if it were possible to avoid re-use of the washer effluent. The value of the fibre it contains is negligible but the heat is essential to maintain grinder pit temperatures. For a period of one month the washer effluent was not recovered, causing the pit temperatures to fall to 150° F. This temperature was too low to produce a pulp with the required wet strength. Paper machine efficiencies dropped sharply, making corrosion a secondary problem. Current operations are based on using sufficient effluent to maintain a stone shower temperature of 110° F. with the balance going to the sewer.

Disadvantages

From the standpoint of results achieved in maintaining a G.E. brightness of 56 or better at the paper machines, the bleaching system is eminently successful. Unfortunately it also possesses drawbacks. The re-use of washer effluent and the use of paper mill white water as wash water complicates the operation of the mill. The proportion of washer effluent to decker white water can be maintained, but the temperature of the effluent continually fluctuates due to the varying amount of paper mill white water used to maintain a constant level in the washer vats.

Obviously any change in the temperature of the white water supplied to the stone showers is immediately reflected in varying stone consistencies. Any severe drop in temperature can be overcome by increasing the amount of effluent returned to the grinders but only at the expense of increased corrosion.

With the present conditions of wood supply and comparatively open white water system, zinc hydrosulphite usage is probably low enough to prevent excessive corrosion. Increasing the amount of hemlock ground or increasing the fibre recovery would force an increase in the amount of hydrosulphite used to maintain the required brightness. Any acceleration in the present rate of corrosion would result in costly equipment replacements.

Proposed Change

At the present time serious consideration is being given to bleaching the deckered stock. Such a change would involve returning the grinding, screening, and deckering processes to their original sequence. Stock from the decker chest would be pumped to the retention chambers and then to the washers. Two advantages of such a change would be, first the simplification of daily operation and second the elimination of the corrosion problem. The zinc hydrosulphite solution would be added to the suction side of the pump as at present. All the effluent from the washers would be sewered, making it possible to safely reduce the amount of wash water required.

Retention time would have to be increased to compensate for the lower temperature of the deckered stock. Probably zinc hydrosulphite usage would be slightly higher.

The proposed change would solve the problem of excessive corrosion within the grinder room but of even more importance, it would eliminate the intricate system of temperature controls and white water recirculation, the cause of many of the stock quality fluctuations.

German Paper Industry Production and Capacity

By OTTO GOY

THIS ARTICLE is published here for its value in showing how the pulp and paper industry in Germany is meeting its postwar problems. It is not presented as a contribution to the advancement of the papermaking art.—Editor.

The division of Germany into four zones, the interruption in the collection of material for Central Statistics, together with the general confusion caused by the war, made it almost impossible to gain a clear picture of the condition of the German paper industry. As things began to settle down it has gradually become possible to discern how badly this industry was hit by the war.

British Zone

In the section of Germany which now constitutes the British Zone about 22,000 persons were employed in about 135 pulp and paper mills before the war. These mills made almost every grade of paper except photographic, carbonizing, condenser and pressboard. The annual output in 1939 was 780,000 tons although the capacity was estimated at 870,000 tons. A large proportion of the mills in this zone made fine papers and specialties and a large percentage of the production was exported.

About 25 mills were destroyed during the war and many others were badly damaged. The present estimated annual capacity is about 100,000 tons less than pre-war, but the actual production during 1946 was only 164,000 tons or about 22 percent of the estimated capacity. Of course the great shortage of all raw materials, supplies, equipment, etc., accounted for much of the lost production. Obviously, the

paper shortage under these conditions is acute. The figures for 1947 are not available as yet, but there should be considerable improvement even though the production is still far short of full capacity. During 1946 only seven kilograms of paper per person was available in this zone, whereas the pre-war per capita consumption was 45 kilograms.

The chemical pulp mills in the British Zone have an estimated annual capacity of 70,000 tons but were able to produce only 20,000 tons in 1946. The scarcity of pulpwood in the British Zone was in a large measure responsible for this low production. Even if the production of the mills in this zone reaches 100 percent of capacity the amount will fall far short of the estimated requirements of 270,000 tons of chemical pulp. In other words, the British Zone cannot make enough chemical pulp to supply its own requirements and efforts to import this material have so far been unsuccessful.

The groundwood mills in this zone have an estimated annual capacity of about 325,000 tons, but the present supply of wood allows them to produce less than one-third of this amount. There seems to be very little chance of improvement in this situation.

The situation in regard to supplies of old paper, straw and rags is similar. The supply to the mills of these raw materials is insufficient. Rags are almost unavailable for the paper mills because they are reused for textiles. Old-paper is consumed in the households and in other trades, so that the amount left for the paper and board mills is insignificant. Turf has been substituted as raw material in considerable amount for the production of board.

French Zone

Of the former 63 factories of the paper, paperboard, chemical pulp and groundwood pulp industry in the French Zone 37 were in operation in the spring of 1946. In the meantime, 12 other plants have been put into operation. Among these 49 plants are two which produce chemical pulp exclusively and three which specialize in producing mechanical pulp. For the rest, all sorts of paper and paperboard are manufactured, with the exception of press-board and photographic papers. During the year the production of the French Zone totaled 72,000 tons of paper and paperboard, 56.5 percent of which were writing and printing paper, 32 percent wrapping paper and paperboard, and 11.5 percent specialties. In the first half of 1947 the production was raised to 37,200 tons in spite of the severe winter. The proportion of wrapping paper and paperboard was somewhat larger, while the percentage of special paper declined to 9.4 percent.

The paper and paperboard factories of the French Zone produced 228,000 tons of paper and paperboard in the last peace year 1938. This was not quite ten percent of the total German production in the same year. The production in the French zone in 1946 was 25 percent of the peace-time production, but there was a change in the various grades. The production of wrapping papers reached 60 percent and the production of printing paper reached 55 percent of the peace-time production, while special papers reached only 18 percent and paperboard reached only 11 percent of the former production. Besides the insufficient supply of raw material, the reason for this shift in the grades lies in the changed market conditions for the paper industry in the French Zone. The mills here are now limited in their deliveries only to the territory of the French Zone. In 1939 the total production considering the different sorts was subdivided as follows:

Writing paper and printing paper	35%
Packing paper	27
Paperboard	26
Special paper	12

Russian Zone

From the Russian Zone no official statistical material is available. The German pulp industry has suffered a decrease in monthly production capacity of 31,000 tons of pulp by the loss of five great chemical pulp factories in Tilsit, Laikheim and Cosse near Koenigsberg, and Ragnit and Odermunde near Stettin. That is 24.5 percent of the total chemical pulp capacity of the German territory of 1938. According to carefully made private inquiries, 34 plants have been dismantled, 55 have been taken into the property of the state, five are now in Russian hands and 205 are destroyed while 30 plants cannot produce for undetermined reasons.

On the basis of the capacity figures of the last peace year 1938, the following picture results:

	Paper	Paper-board	Chem. Pulp	Mech. Pulp
Dismantled	55 %	30.3%	23.4%	48.0%
State-owned	15.3	18.9	57.8	13.5
In Russian hands	4.9	1.6	10.8	3.7
Privately owned	24.0	44.4	8.0	32.5
Destroyed	0.5	3.8	...	1.2
Not in operation	0.3	1.0	...	1.1
	100 %	100 %	100 %	100 %

In the first nine months of 1947 the paper and paperboard industry in the Russian Zone has fulfilled its production standard within 80 percent in spite of the production limitations caused by the drouth. The paper industry in this zone is favored in the allotment of raw and subsidiary materials and it has some protection against a compulsory removal of its workers for other projects. A considerable part of the production is claimed by the occupational forces, partly for export. Most of the plants are not able to use their capacity to the full extent because of the unsatisfied need for major repairs. In many cases allotment of iron for repairs is insufficient. There are further great difficulties in procuring repair parts because most of the machine factories are in Western Germany.

In the exports from the Russian Zone there have been deliveries of printing paper to Italy, technical papers to Bulgaria and papers of all kinds to Hungary. Some of the exports went as far as India.

All Four Zones

For all four zones of occupation of Germany the following situation concerning chemical pulp exists. In the former territory of Germany the capacity for the production of chemical pulp was 126,000 tons per month in 1938. A monthly reduction of 31,000 tons or 24.5 percent of the total capacity was caused by the mentioned loss of five mills in East Germany. In addition, the production capacity of the plants located in the territory given to Poland must be considered lost. This makes another 14.8 percent. Finally, there must be deducted 4.5 percent for the dismantling of plants in the Russian Zone. So the total loss of production capacity for chemical pulp amounts to 44 percent.

If, in 1949, the remaining chemical pulp mills should be able to reach full production, there will still be a shortage of 15,200 tons of chemical pulp in order to supply the allowed paper quantity of 26 kg per person per year. It is not possible to build new mills or to enlarge the existing plants because the necessary boilers, machines and other equipment cannot be procured. The missing production is 12 percent of the chemical pulp requirements, according to the set production standards. The consumption of cellulose by the rayon industry and plastic industry is not included but it is estimated at 500 tons per month. Obviously, this gap can only be closed by foreign imports but it is doubtful that the necessary foreign exchange will be available for this purpose in the near future.

Literature

McCulloch Motors Corp., 6101 W. Century boulevard, Los Angeles, 45, Calif. Specification Sheet, "McCulloch Chain Saws." Applications of the saw industries where wood cutting and land clearing are important are discussed.

Minnesota Mining & Mfg. Co., 900 Fauquier avenue, St. Paul 6, Minn. Booklet, "Scotch Brand Electrical Tapes." Features plastic-backed electrical tape No. 33 designed to afford both the electrical insulation of rubber tape and the mechanical protection of friction tape in a single wrapping operation. Contains 86 photographs of

electrical tape applications, describes tapes and research and includes a discussion of electrolytic corrosion. Tape properties are listed, including backings, thickness, tensile strength, elongation, adhesion, insulation resistance, dielectric strength, and electrolytic corrosion factor for each tape.

Oakite Products, Inc., 22 Thames street, New York 6, N. Y. Booklet, "Modern Oakite Cleaning Methods for Paper and Pulp Mills." Provides specific material recommendations and data on job-procedures, solution concentrations, etc., for performing a broad range of paper-mill cleaning operations. Features a convenient cleaning table summarizing materials and procedures recommended for cleaning dandy rolls, save-all screens, suction boxes, head boxes, screen plates, etc.

Buffalo Forge Co., 490 Broadway, Buffalo, N. Y. Bulletin, "Limit-Load Conoidal Fans". Provides in text and cuts valuable information on the various types and sizes of Type LL Fans. Typical specifications, arrangements and constructions also are discussed.

Burrell Technical Supply Co., 1942 Fifth avenue, Pittsburgh 19, Pa., Bulletin No. 213, "Burrell Industro Gas Analyzer." Presents information on rapid control analysis of gas mixtures comprising carbon dioxide, carbon monoxide, oxygen, hydrogen, nitrogen in various applications.

Calco Chemical Div., American Cyanamid Co., Bound Brook, N. J. Technical Bulletin, "Solubility of Dyes for the Paper Trade," a reprint. Presents reliable solubility data for the practical colorist in coating, staining or beater dyeing.

International Brotherhood of Bookbinders, Local 4, Washington, D. C. Treatise, "Facts Relating to Government Printing and Binding." Gives revealing data on workings of U.S. Govt. Printing Office, pertinent statutes controlling printing to be done, limitations and definitions of printing.

J. M. Huber Corp., 620 62nd street, Brooklyn 20, N. Y. Booklet, "Let's Get Acquainted." Describes and illustrates Huber printing inks, kaolin clay, carbon black, oil and gas in terms of their end use in breadwrappers, chinaware, newspapers, etc.

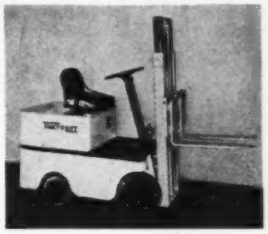
Yale & Towne Mfg. Co., Philadelphia Div., 4530 Tacony street, Philadelphia 24, Pa. Bulletin, "Worksaver, Telescopic Tilting Fork Electric Truck." Provides specifications and operational data of model M20TTF.

Elliott Co., Jeannette, Pa. Bulletin PB 2000 "Fabri-Steel Synchronous Generator." Fifteen detailed views illustrate and explain construction features. Special mechanical modifications with cuts and descriptions also are included.

Equipment & Supplies

Tract-R-Lift

Tract-R-Lift, 2000-lb. capacity, is announced as a compact, gas-powered fork truck for rapid materials handling through narrow doors and aisles and in cramped quarters. Measures 82 inches wide by 61 inches long; weighs 3,050



lbs. Turning radius inside, 6 inches; outside, 67 inches. Maximum fork height with 5-foot mast, 84 inches; with 7-foot mast, 108 inches. Forks are provided with automatic stop at maximum lift height and are adjustable from 9 to 26 inches outside widths. Speeds to 10.9 mph forward and 8.9 mph reverse, with low speed gears in both directions. Power is furnished by 4-cylinder, water-cooled Waukesha ICK gasoline engine capable of handling full loads up inclines of 15 degrees. Features single hydraulic lift-and-tilt control lever designed to raise or lower forks and to tilt load forward or backward in any combination of simultaneous movements desired; axle and steering gear having sealed needle and thrust bearings engineered to provide easy steering under all operating conditions; full double-shoe hydraulic brakes which lock automatically when driver leaves seat; front wheel drive unit mounted integrally with transmission and engine for easy access to all parts; full 9-inch clutch which can be exchanged in two hours without dismantling component parts. For details and prices write to Tract-R-Lift Corp., 605 N. Aberdeen street, Chicago, Ill.

Three New Glycols

Butanediol-1,3; 2-methylpentanediol-2,4; and octylene glycol are now in U. S. commercial production. They are announced as good plasticizers and softeners for animal glues, casein, cork, gelatine, polyamide resins and zein compositions; useful as coupling or blending agents for cosmetic creams and metal cutting, leather and textile oils, and as solvents for essential oils, natural gums and resins. Also used as intermediates for alkyd resins and plasticizers for synthetic resins. *Butanediol* is described as a mild-odored, colorless liquid miscible in all proportions with water and alcohol, less volatile and more viscous than its lower homologs, ethylene glycol and propylene glycol. Hydroscopicity is rated as about 60 percent that of glycerol and three times that of octylene glycol. Its derivatives are less water soluble and more soluble than those of ethylene glycol. *Methylpentanediol,* a colorless liquid of mild hygroscopicity, is said to retain constant moisture content over a wide range of humidity. It is miscible with water; with the lower alcohols: ethers, ketones and esters; chloroform; and ethylene dichloride. *Octylene glycol* is a colorless, 1,3 diol of low volatility. Said to be the first commercially available glycol having limited water-solubility. Its viscosity is rated as much greater than that of the lower diols but less than that of glycerol. It is about one-tenth as hydroscopic as glycerol at 65 percent relative humidity and at 21 deg. C. For details and prices write to Carbide and Carbon Chemicals Corp., Unit of Union Carbide and Carbon Corp., 30 East 42nd street, New York 17, N. Y.

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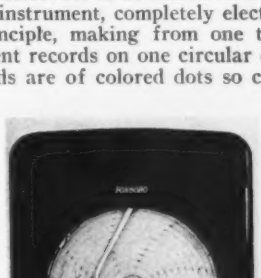

spaced as to make virtually continuous lines. Instrument may be used for measurement of temperature, pressure, humidity, liquid level, pH, conductivity, speed and other process variables. It is stated that the Recorder has only one measuring system, either resistance bulk or EMF type, that a positive-acting switching unit automatically brings the vari-colored pens into recording position at 6-second intervals in any sequence desired. Sequence and number of points may be easily changed. Complete color-coding is designed to prevent possible mismating of circuits and pens. Special "dry ink" provided for clean recording. Unit will operate continuously for several weeks without reinking, manufacturer states. For details and prices write to Foxboro Co., Foxboro, Mass.

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Wet Strength Development with Neutral, Water Soluble Polymers*

By R. J. Myers[1] and L. E. Kelly[2]

Abstract

It is generally recognized that a wet-strength resin should meet the following requirements: It should develop a high degree of wet strength per unit weight of resin employed; the wet strength quality should be more-or-less permanent; no undesirable characteristics should be simple. Other requirements (ease of broke recovery, wet-rub resistance, fold-endurance, etc.) may be added in special cases. It is probable that no single resin will meet all the requirements.

A study was made of the relative wet-strengths developed by four different synthetic resin polymers in paper, when added by impregnation. One resin was found to develop very high wet and dry tensile strengths under neutral conditions, no added catalyst and at normal drier temperatures. The wet-strength so developed was found to be resistant to acid hydrolysis, and retained in large measure over long periods of immersion in water; the wet strength was easily destroyed by treatment of the paper under mildly alkaline conditions.

An interpretation of the results is attempted on the basis of the chemical and physical characteristics of the resins examined. Preliminary experiments on use of the resins as wet-end additives are reported.

While the initial interest in the neutral, water-soluble polymer resides in the wet-strength characteristic, other properties of the resin suggest additional applications in the paper field. The high degree of tack and adhesion to rough surfaces, the resistance of the film to oils, and the action of bacteria and fungi, the emulsifying, thickening, and general protective colloid character of the resin appear to offer promise in paper coatings and other paper converting operations. Other uses as a modifier for starches, polyvinyl alcohol, glue, casein, and sodium silicate are indicated.

Water-soluble polymeric materials of natural origin have been used in papermaking processes almost as long as paper has been made. Glue, starch, and natural gums have been and are today added to the pulp slurry or used in size presses to improve the strength, the grease-resistance, and the printing or writing qualities of paper. The advent of synthetic polymeric substances that could be applied in aqueous solution enlarged the possibilities for modification of the properties of papers, and one of the more significant of these recent developments has been the manufacture of wet-strength paper with the aid of urea-formaldehyde and melamine-formaldehyde resins both in the beater and in the tub. Other polymeric materials such as viscose, resins derived from phenol-formaldehyde, acetone-formaldehyde, and aniline-formaldehyde condensations, and polyvinyl acetal resins have been used or reported as useful in the manufacture of wet-strength paper.

The several qualities to be desired in an "ideal" wet-

TABLE I.—WATER SOLUBLE RESINS

Resin No.	Type or Composition	Solids [5]	Viscosity,[5] poises	pH [5]	Remarks
A	Urea-falmaldehyde [1]	36.5	72" [6]	6.4-8.0	HCHO/Urea = 2.32 mole ratio
B	Modified urea-formaldehyde [2]	45.0	0.65-1.4	7.0-8.4	Modifying group = sulfonic
C	Ammonium polyacrylate [3]	14-15	188	8-9.5	High molecular weight
D	Water-soluble polymer [4]	20.0%	45-100	7.0-8.0	Neutral, infinite water tolerance

[1] Uformite 414, The Resinous Products and Chemical Co., Philadelphia, Pa.
[2] Uformite 467, The Resinous Products and Chemical Co., Philadelphia, Pa.
[3] Acrysol GA, Rohm and Haas Co., Philadelphia, Pa.
[4] Amberlite W-1, The Resinous Products and Chemical Co., Philadelphia, Pa.
[5] As manufactured.
[6] Saybolt Universal seconds viscosity.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948.

[1] Member TAPPI; Head, Miscellaneous Resin Applications Laboratory, The Resinous Products and Chemical Co., Philadelphia, Pa.
[2] Research Chemist, The Resinous Products and Chemical Co., Philadelphia, Pa.

TABLE II.—WET AND DRY TENSILE STRENGTH DEVELOPMENT (TUBBING EXPERIMENTS)

Resin	Concentration in Bath	Catalyst and Concentration	Resin Pick-up	Temperature, Time of Drier	Age When Tested, hr.	Dry Tensile, lb./in.	Wet Tensile,** lb./in.	Dry Tensile Increment Over Control	Wet Tensile Increment Over Control
Control	None	None	.....	.....	..	5.3	0.50	..	..
Uformite 414	3%	Aluminum sulphate, 6% on resin	2.1%	1 min. 95° C.	4	7.1	2.0	1.8	1.5
				2 min. 95° C.		5.8	2.0	0.5	1.5
Uformite 467	3%	Aluminum sulphate, 6% on resin	2.6%	1 min. 95° C.	4	7.4	2.7	2.1	2.2
				2 min. 95° C.		7.4	2.7	2.1	2.2
Ammonium polyacrylate	3%	None	2.8%	1 min. 95° C.	4	10.3	0.5	5.0	0.0
				2 min. 95° C.		10.8	0.5	5.5	0.0
				5 min. 150° C.*		11.6	1.9	6.3	1.4
Amberlite W-1	3%	None	2.4%	1 min. 95° C.	4	11.9	2.4	6.6	1.9
				2 min. 95° C.		12.4	4.1	7.1	3.6
	4.5%	None	4.5%	2 min. 95° C.		10.0	3.8	(5.3)***	3.3
				2 min. 95° C. + 2 min. 150° C.		10.8	7.2	(6.1)***	6.7

* Paper placed in circulating air oven at 150° C.
** Wetted 1 hour in distilled water.
*** Control dry strength 4.7 lb./in.

strength resin would be difficult to enumerate exactly since the ultimate application of the paper, and the particular paper manufacturing process employed, among other factors will determine the relative importance of each desired quality. In general, however, a wet-strength resin should meet the following requirements:

1. It should develop a high degree of wet and dry strength per unit weight of resin employed.

2. The wet-strength quality imparted by the resin should be more-or-less permanent, at least during the normal useful life of the paper.

3. The resin should not impart undesirable characteristics to the paper, such as odor, color, or excessive embrittlement.

4. The method of application of the resin should be simple and adaptable to present paper-manufacturing procedures. Moreover, the conditions of application should be such that the fundamental characteristics of the paper (strength, durability) are not impaired.

To these might be added (as the occasion demanded), ease of broke recovery, wet-rub resistance, fold-endurance, low unit cost, insensitivity to variations in pulp, water and other ingredients of the furnish, utility as a wet-end additive, uniformity, acid-resistance, and a variety of other requirements. It is probable that no single resin will meet all the requirements and the field of usefulness or any particular resin will be determined by the extent to which the more basic requirements are met.

Recent investigations into a relatively new field of polymer chemistry have uncovered another synthetic resin that imparts wet-strength to paper and possesses in addition a combination of other properties which suggest general usefulness in the paper field. While the development is still very much in the laboratory phase, preliminary findings have been sufficintly promising to warrant a description of the resin and its properties on this program, with particular reference to the extent to which it satisfies some of the more basic requirements enumerated above.

The performance of a wet-strength additive is determined by its chemical and physical properties and the comparative behavior of various additives may be considered on the basis of the influence of several physical and chemical factors. It is also much simpler to study the comparative performance on tub-sized or laboratory-impregnated sheets, although it is recognized that wet-end addition of additives is preferred in many paper-making processes. In this paper the authors have attempted to analyze the relative performance of some typical water-soluble wet-strength resins. Much of the work is confined to simple tub-size experiments; beater-addition studies are still in progress and only a preliminary report will be made at this time.

Experimental Investigations

Materials Examined

The water-soluble resins selected for comparison are listed in Table I with a description of their basic physical properties.

Tubbing Experiments

The resins were diluted to 3% concentration, except where noted, and impregnation of a 100% sulphite saturating paper* was carried out at room temperature. After the sheet was dipped into the sizing bath, excess solution was removed with a wringer roll, and the sheet dried under blotting paper on a paper drier for various times. The per cent resin in the paper was determined from the weight of the paper before and immediately after impregnation, before drying. (*Hurlbut 720)

TABLE III.—WET STRENGTH RETENTION AFTER ACID HYDROLYSIS

Solution: pH 4.0, 180° F. aluminum sulphate.
Time: 1 hour immersion. Tub-sized sheets.

Resin	% in Paper	Wet Tensile Values, Original	Wet Tensile Values, Acid Treated	Increment Over Control Remaining
Resin B	3.3	2.4	0.5	0.0
Resin D	3.0	3.1	4.4	4.4
Control	0	0.5	..	..

The dry tensile values were determined on 1-inch wide strips of paper (4 inches long) placed in the jaws (2 inch gap) of an IP-4 Scott Tensile Tester after the dried sheet had been conditioned at 70°F. and 65% R.H. for 1 hour. The wet tensile values were determined in a similar manner after the conditioned paper samples were immersed in distilled water for various period of time.

Magnitude of Wet Strength Development

A study was made of the relative magnitude of the dry and wet tensile values produced by the resins under conditions deemed optimum for wet-strength development. Some selected results are shown in Table II.

"Permanence" of the Wet Strength Developed

There is an interest in wet strength which is retained over long periods under conditions of high temperature, high humidity and acidity or alkalinity. The retention of wet strength values after prolonged immersion in water is also of significance. Simple experiments were

TABLE V.—WET STRENGTH RETENTION AFTER PROLONGED IMMERSION IN WATER OF TUB-SIZED SHEETS

Resin	% Resin in Paper	Wet Tensile After Immersion For 1 hour	24 hours	96 hours	120 hours	144 hours (% of original)
Resin B	4.0	4.7	3.8	2.6	2.4	2.6 (55%)
Resin D	4.0	5.8	4.8	4.1	4.2	4.1 (71%)
Control	0.0	0.5				
Resin B beater addition	4.0	4.7	4.8	4.8	4.8	4.8 100%

devised in which the treated papers were immersed in acid and alkaline solutions, and in distilled water, for fixed periods, and then removed and tested for wet tensile strength. The results are shown in Tables III, IV, and V.

Zero-Span Tensile Values

To determine the effect of the resin upon the fiber itself, "zero-span" tensile values were determined by the methods of Clark *(1)* and Salley *(2)*. Results are shown in Table VI and Table VI-A.

Wet-end Addition Experiments

A few experiments were made on the addition of the neutral water-soluble polymer to lightly beaten kraft and sulphite pulps. A convenient modified urea-formeldehyde resin (Resin B) was examined in parallel. The results of the wet and dry tensile measurements are shown in Table VII.

Discussion of Results

An analysis of the effects obtained can be made on the basis of the chemical and physical characteristics of the resins involved.

Resin A (Uformite 414) is a conventional urea-formaldehyde resin, condensed to a "B" stage where further condensation to a water-insoluble condition is effected by the use of acid catalysts, heat, and the removal of water. The resin solution is limpid and the condensed resin is of intermediate molecular size.

TABLE IV.—WET STRENGTH RETENTION AFTER ALKALINE HYDROLYSIS

Solution: pH 10.6, 180° F., sodium hydroxide.
Time: 20 minutes. pH at end: 8.6.

Resin	% Resin	Wet Tensile Values Original	Alkali Treated	Increment Remaining
Resin D	2.38	4.3	1.8	1.3
Control	0	0.5	0.5	..
Resin B	4.00	3.5	3.4	3.4

Resin B(Uformite 467) is a modified urea-formaldehyde resin designed specifically for wet-strength development when added to the pulp in paper-manufacturing process. The resin is a highly condensed hydrophil with solubilization achieved through sulphonic acid groups. Further condensation to an infusible polymer is effected by acid catalysts, heat and the abstraction of water. The role of aluminum sulphate when employed as a catalyst in beater work, appears to be two-fold, an action similar to that of a mordant to deposit the resin on the pulp fibers and as an acid catalyst to effect the condensation of the resin and further interaction between the resin and the "hydrated" pulp substance. The resin solutions are more viscous than those of resin A and the resin is of a larger molecular size.

Resin C (Acrysol GA) is a high molecular weight linear polymer, ammonium polyacrylate. The solutions are highly viscous and show a degree of tack and adhesion to rough surfaces. By the use of acids, heavy metal salts and heat, the polymer may be insolubilized.

Resin D (Amberlite W-1) is a solution of a neutral polymer with infinite water dilutability. The dry resin is readily obtained in the form of clear, essentially colorless films which have physical properties similar to casein but are resistant to the action of most bacteria and fungi. The resin films may be insolubilized by heat, formaldehyde or metallic salts. The solutions are very viscous and show a high degree of tack and adhesion to rough surfaces. The resin shows an interesting interaction with animal glue wherein gels are formed at certain ratios of glue to resin D. Films of the resin dried at 60°C. are instantly resoluble; at temperatures of 150°C. and higher the films became insoluble in water and other solvents. The resin solution exhibits the character of a protective colloid, with emulsifying and thickening properties.

Magnitude of Wet Strength Development

The data in Table I indicate that a wide range of wet and dry tensile values was produced by the different resins, that an increment in wet tensile strength was accompanied by an increment in dry tensile (but to a

TABLE VI.—ZERO SPAN TENSILE

Resin	Application	Catalyst	% Resin in Paper	Machine Direction Dry	Wet	%	Cross Machine Direction Dry	Wet	%
No resin	..	0	0	9.75	7.4	76	9.4	6.8	72
Resin D	Tub	No	1.5	7.6	7.7	101	6.9	6.6	96
Resin B	Tub	Alum pH 4	1.5	8.3	7.7	93	7.4	6.8	92
Resin B	Tub	HCl pH 4	1.5	10.4	8.9	85	8.3	6.8	82
UF 470 *	Tub	Alum pH 4	1.5	10.2	8.5	83	7.3	6.3	86
UF 470 *	Tub	HCl pH 4	1.5	9.9	7.7	78	8.2	7.1	86

TABLE VI-A.—ZERO SPAN TENSILE VALUES

Resin	Application	Catalyst	% Resin in Paper	Machine Direction Dry	Wet	%	Cross Machine Direction Dry	Wet	%
Resin D	Tub	No	4.5	12.6	9.2	73	10.7	8.2	77
Resin D	Tub	No	5.5	12.5	9.7	77	11.5	8.4	73
Resin B	Tub	Alum pH 4	4.5	12.9	8.6	66	10.0	6.8	68
UF 470 *	Tub	Alum pH 4	4.5	11.5	8.7	75	10.3	7.0	68
		Resin added at the beater							
				Dry	Wet	%			
No resin	Sulphite	No	0	10.2	7.7	58			
Resin B	Beater	Alum pH 4	1.5	11.5	7.7	59			
No resin	Sulphite	No	0	10.2	5.2	51			
UF 470 *	Beater	Alum pH 4	1.5	11.0	6.4	58			
No resin	Sulphite	Alum pH 4	0	12.1	9.3	77			
Resin D	Beater	Alum pH 4	..	12.7	11.1	88			
No resin	Kraft	HCl pH 4	0	16.0	11.9	74			
Resin D	Beater	HCl pH 4	..	15.9	15.8	100			

* UF 470—Modified urea formaldehyde resin, cation active. Resinous Products & Chemical Co.

TABLE VII.—BEATER ADDITION EXPERIMENTS

Resin	Pulp	Catalyst	Cure Conditions	Dry Tensile, lb./in.	Wet Tensile, lb./in.	Increment: Dry Tensile	Increment: Wet Tensile
Control	Sulphite	pH 6-7	95° C. 5 min.	6.6	0.5	...	...
Resin D	Sulphite	pH 6-7	95° C. 5 min.	5.4	0.4	0	0
Resin B	Sulphite	pH 6-7	95° C. 5 min.	6.6	0.5	0	0
Control	Sulphite	pH 4 alum	95° C. 5 min.	6.87	0.66	...	...
Resin D	Sulphite	pH 4 alum	95° C. 5 min.	9.76	1.97	2.89	1.31
Resin D	Sulphite	pH 4 alum	150° C. 2 min.	11.40	2.67	4.53	2.01
Uformite 470	Sulphite	pH 4 alum	95° C. 5 min.	10.31	2.80	3.43	2.14
Uformite 470	Sulphite	pH 4 HCl	95° C. 5 min.	11.83	3.26	4.96	2.60
Control	Kraft	pH 4 HCl	95° C. 5 min.	8.63	0.49	...	...
Resin D	Kraft	pH 4 HCl	95° C. 5 min.	14.66	1.39	6.03	0.90
Resin D	Kraft	pH 4 HCl	150° C. 2 min.	17.80	3.50	9.17	3.01
Resin B	Kraft	pH 4 HCl	95° C. 5 min.	18.40	3.67	9.77	3.18
Resin B	Kraft	pH 4 alum	95° C. 5 min.	19.76	5.58	11.13	5.09

lesser degree), and that dry tensile could be appreciably increased without an increase in wet tensile. The two urea-formaldehyde type resins produced increments in wet and dry tensile values of about the same order; the neutral, water soluble polymeric products (resin D and ammonium polyacrylate) produced exceptionally high increments in dry strength. Resin D produced also a very high value of wet strength.

The mechanism by which the various synthetic resins produce wet strength is as yet not known. It is probable that the increment in dry strength is the result of the introduction of new adhesive bonds between the fibers. The resistance of the new bonds to the disintegrative action of water determines the magnitude of the wet strength observed. Such resistance can be achieved by an insolubilization of the adhesive bond itself without destruction of its general physical character, or an interaction with the fiber surface to produce an insoluble substance. Based upon the general knowledge of the chemistry of urea-formaldehyde resins it is probable that both processes are involved. In the case of ammonium polyacrylate the high molecular weight linear polymer exhibits good tack and adhesion in solution and against cellulosic surfaces; these properties appear to have introduced many strong bonds between fibers so that a large increment in dry strength resulted. However, the ammonium polyacrylate polymer was not insolubilized by the mild temperatures of the paper drier (95°C.) and no appreciable interaction with the cellulose appears to have occurred at this temperature so that the bonds were readily disintegrated by water and no wet strength was observed. At higher temperatures (150°C.) an insolubilization of the ammonium polyacrylate occurred (there is a possibility that some interaction with the fiber surface may have occurred also) so that an appreciable wet strength was observed.

The behavior of the polymer, resin D, is of particular interest. The development of many strong bonds between fibers so that a large increment in dry strength was observed, was similar to the behavior of the ammonium polyacrylate, and is in accord with the excellent tack and high adhesion to paper surfaces shown by the resin in bulk. However, in contrast to ammonium polyacrylate, the coversion of the resin bonds to a relatively insoluble condition was effected at ordinary drier temperatures so that high values of wet strength were obtained. There is evidence that the temperature of the drier was sufficient to effect also some interaction with the fiber surfaces since films of the polymer alone were not insolubilized when heated at 100°C. for corresponding periods of time. Higher temperatures however, produce still greater increases in wet tensile strengths.

The physical characteristics of the fibers particularly in regard to tensile strength show no difference between treated and untreated paper in zero span tests. It is evident that there is little or no difference between the paper treated with the neutral polymer and the urea formaldehyde resins, in resin B UF 467 and and UF 470 catalyzed at pH 4.

However, there is a marked difference in 2-inch span tensile values between resin D, resin B, and UF 470. The efficiency and final effect is considerably greater and has been discussed.

When more resin is present, in this case 4.5 to 5.5%, the zero span tensiles are measurably increased. This would tend to indicate that the fibers are being coated to some extent.

With paper made in the sheet mold all indications are that the resin is not affecting the ultimate fiber strength. The differences present are not considered great enough to conclude otherwise. In the case of the kraft paper, this was heated for 2 minutes at 150°C. and the wet zero span tensile does indicate a change in fiber properties.

However, when normal procedure is used whether in tub sizing or beater addition of the resin, no change is noted in the wet zero span tensile until an excess of resin is present in quantities of 4% or more. Further, there is no measurable difference in the fibers whether they are treated with the neutral polymer or with the modified urea formaldehyde resins.

The production of wet strength by the high molecular weight polymers was effected in the neutral range without the use of acidic catalysts or other agents. This fact would seem to present interest in many paper manufacturing processes. Further investigations into a variety of other polymers have revealed that the production of both high dry strength and high wet strength in the neutral range without accessory agents at normal dryer temperatures is a rare phenomenon.

Permanence of the Wet Strength Developed

From a practical standpoint the resistance of the wet-strength bond to acidic, neutral and alkaline conditions is

TABLE VIII

Condition	Kraft: Catalyst	Kraft: Dry Tensile	Kraft: Wet Tensile	Sulphite: Catalyst	Sulphite: Dry Tensile	Sulphite: Wet Tensile
100 p.p.m. Ca^{++} } 50 p.p.m. SO_4^{--} }	....	....	... ...	6% alum HCl pH 4	7.33 6.51	1.24 1.31
100 p.p.m. Ca^{++} } 500 p.p.m. SO_4^{--} }	6% alum HCl pH 4	12.31 12.83	2.23 2.35	6% alum HCl pH 4	7.66 6.82	1.24 1.79
500 p.p.m. Ca^{++} } 50 p.p.m. SO_4^{--} }	6% alum HCl pH 4	13.55 9.8	2.06 1.19	6% alum HCl pH 4	8.9 8.5	2.05 1.95
500 p.p.m. Ca^{++} } 500 p.p.m. SO_4^{--} }	6% alum HCl pH 4	13.82 17.80	2.91 3.52*	6% alum HCl pH 4	11 40 9.55	2.67* 1.98

* Note: that no significant differences are apparent until the high concentration of the calcium and sulphate ion is reached.

of great importance as it determines on the one hand the utility and durability of the paper and on the other hand the method of recovery of "broke" or waste paper. The results shown in Tables III-V are presented as preliminary indications of the relative performance of resin-treated papers in the laboratory; these indications must be verified by further work particularly under conditions encountered in the mill and in the field before definitive statements can be made.

The destruction of the wet-strength bonds produced by urea-formaldehyde and melamine-formaldehyde resins, under conditions of high temperature and low pH is well-known and in fact forms the basis for the recovery of "broke" where these resins are employed. This behavior is illustrated by the values shown in Table III. It is of interest to note the resistance to the acidic conditions shown by the wet-strength bond produced by the polymer, resin D. The acid conditions appear to have effected a further insolubilization of the resin so that a higher wet strength was found after the treatment. These findings suggested that the wet-strength bond could be removed by treatment with alkaline solutions, toward which urea- and melamine resins are known to be relatively resistant. Table IV indicates that mild alkaline conditions are quite effective in the destruction of the acid-resistant wet-strength bond; however, additional work must be done to develop a more complete "broke recovery" method.

It is generally recognized that the wet-strength phenomenon may be defined in various ways, dependent upon the method of measurement. Thus, some consideration has been given to a classification of "temporary" and "ultimate" wet strength according to the values obtained after various periods of immersion in water. Again, the Wet Strength Committee of TAPPI has defined wet strength as "the strength of the material after complete saturation with water. Complete saturation is defined as exposure to water until the specimen is wetted throughout and no appreciable loss of strength occurs on continued soaking." One difficulty with any attempt to determine wet-strength in which prolonged immersion is involved is that leachable components of the treated paper may well influence the result. Nevertheless, the practical meaning of the concept of wet-strength is generally understood and the principal problem in most instances is the selection of a time of immersion which is practical for mill operation, yet which yields a value of significance.

The values in Table V indicate that there is a gradual fall in wet strength values upon prolonged immersion of the tub-sized sheet but that a "constant" value is reached, in these cases, in 96 hours or possibly less. The percentage fall in value is, however, not the same and the time of immersion may well be insufficient if other factors, such as the presence of salts and the influence of temperature, were taken into consideration. Under the conditions of the experiment the wet strength produced by the neutral polymer, resin D was retained more effectively than that produced by the urea-formaldehyde resin. A definite "sizing" effect was observable in the papers treated with the resin D solutions. However, the paper was thoroughly wetted out in 1 hour immersion. The results indicate that similar tests should be made in each wet strength problem, and the correlation between short-and long-time immersions must be made to yield a reliable control method. When the resin is added at the beater, the wet strength is retained at its original value even over long periods of immersion. The wet strength arrived at in this manner appears to be as permanent as the fibers themselves.

Addition to the Pulp

The few experiments summarized in Table VI show that a resin must be carefully designed to be adsorbed upon the pulp in dilute systems and furthermore that conditions must be adjusted to effect both a reasonable amount of absorption and a subsequent cure. With the neutral polymer it is interesting to note that the sulphite pulp "absorbs" the resin in presence of alum. The UF 470 is most efficient on sulphite with HCl as a catalyst. The reverse is true with kraft pulp. HCl as a catalyst produces good pickup with the neutral polymer. Resin B and alum are considered the optimum condition for wet strength in kraft

Further work indicates that the presence of other ions will produce more efficient pick up of the neutral polymer. More work is required in the field to definitely prove this point but under laboratory conditions the same and better wet strength is attained in hard water as in deionized water. Refer to Table VIII.

As seen in Table VII there is no wet strength produced with deionized water at pH 6 to 7.

Other Properties of the Neutral Polymer

The development of acid resistant high wet-strength values by the neutral polymer, resin D, has been verified in other laboratories and mill trails now scheduled will establish the interest in the paper field from the standpoint of wet strength. Other properties of the polymer, such as those reported above, have been found and some of these presage a possibly greater interest among paper manufacturers and paper converters. It has been possible to study but a few of the other characteristics in the laboratory and the following description is a preliminary report on our findings.

The aqueous solution of the polymer is miscible with water solutions of starches, proteins, polyvinyl alcohol, carboxymethyl cellulose, sodium silicate and lecithin. The tack of the polymer solution is in large measure imparted to solutions of other materials, and the rewettable character of the dry films of resin D suggests possible use in label adhesives. The resistance of the polymer to the action of bacteria and fungi should be of particular interest in such applications. The dry films are brittle, but may be plasticized with glycerine and glycols.

As a protective colloid, the polymer is an effective thickener of emulsions and synthetic latices, and is an emulsifying agent for oils and resins. Paper coated with the polymer shows a high degree of oil resistance. The pigment wetting characteristics are good and a high degree of adhesion to rough surfaces has been found.

Conclusion

Water soluble polymers were found to differ widely in the magnitude of dry and wet strength imporated to paper impregnated with such materials. Very high dry strengths were obtained with high molecular weight water soluble linear polymers. In one case it was found possible to effect an insolubilization of the resin bond under neutral conditions at ordinary drier temperatures, such that very high wet strength resulted. The wet strength so produced was found to be resistant to the action of acidic solutions, retained well over long periods of immersion in water, and removed by treatment with alkaline solutions.

Literature Cited

1. Clark, J. d'A., *Paper Trade J.* 116 (47), 1943.
2. Salley, D. J., *Paper Trade J.* 116 (47), July 3, 1947.

TAPPI Engineering Conference

Buffalo, N. Y., October 25-28

The Third Engineering Conference of the Pulp and Paper Industry will be held at the Statler Hotel, Buffalo, N. Y., on October 25-28, 1948. J. W. Hemphill of the Johns-Manville Sales Corporation will be general chairman.

The first and second conferences were held at Milwaukee and Philadelphia respectively, and were both outstanding successes from the standpoint of attendance and quality of programs. Mr. Hemphill and the chairmen of the committees in the Engineering Division of the Technical Association of the Pulp and Paper Industry have been devoting considerable time and effort since last fall to organizing a program for the Buffalo conference that will justify the time and expense required for individuals intending to be present.

Reservations should be made direct with the Statler Hotel, Buffalo, N. Y. Mention should be made of the TAPPI Engineering Conference since a number of rooms are being held for this purpose. Registration will begin on Sunday, October 24th on the Mezzanine Lounge of the Buffalo Statler Hotel.

As in previous conferences this one is being sponsored by a leading engineering firm, the Westinghouse Electric Company. Part of the meeting will be held in the fine new auditorium of the Company near the Buffalo Airport.

The tentative program is as follows:

Program of Monday, October 25th

8:30 a.m. Registration at the Buffalo Statler.
NOTE: It will also be possible to register on Sunday, October 24th.

9:15 a.m. Opening Remarks by J. W. Hemphill, General Chairman, TAPPI Engineering Division and W. F. Gillespie, President TAPPI.

9:30 a.m. Materials Handling Session:
George R. Wadleigh, Consulting Engineer, New York, N. Y., Chairman.
"Centralized Transportation System", by G. L. Hawkins, Hammermill Paper Company, Erie, Pa.
"Methods of Wood Handling in the Wood Yard", by John A. Willard, Bigelow, Kent & Willard, Boston, Mass.

12:30 p.m. Luncheon (Where you will).

2:00 p.m. Engineering Research and Machine Design Session: Philip H. Goldsmith, Pusey and Jones Corporation, Wilmington Del., Chairman.
"Measurement of Flow Slush Stock", by G. Douglas Zimmerman, Fischer & Porter Company, Hatboro, Pa.
"Continuous Cooking of Kraft Pulp", by Johan Richter, A/B Kamyr, Karlstad, Sweden.
"Tests of Flow-Spreader Models", by Frank M. Sanger, Pusey & Jones Corporation, Wilmington, Del.

7:00 p.m. Dinner.
W. F. Gillespie, Gaylord Container Corporation and President of TAPPI Toastmaster.
Address: "Where is the Bright New World", by Roy Roy Macleod, Vice President, Buffalo Niagara Electric Corporation, Buffalo, N. Y.

Meeting of Tuesday, October 26th

8:30 a.m. Leave Statler Hotel by Special Transportation.

9:00 a.m. Arrive at Westinghouse Auditorium.

9:15 a.m. Steam and Power Session:
J. E. A. Warner, Robert Gair Company, New York, N. Y., Chairman.
"Ways and Means of Treating Water for Steam Boilers and Heat Exchangers", by W. H. Weitzel and D. D. Jones, Hall Laboratories, Detroit, Mich.
"The Papermill Engineer Selects a Turbine", by J. C. Spahr, Westinghouse Electric Corporation, Essington, Pa.

11:30 a.m. Drying and Ventilating Session:
A. E. Montgomery, J. O. Ross Engineering Corporation, Chicago, Ill., Chairman.
"Gas-Fired Infra-Red or Radiant Heat Drying", by G. W. Garland, Garland, Dudley & Jensen, Inc., Cambridge, Mass.

1:00 p.m. Welcome by L. R. Ludwig, Manager, Buffalo Division Westinghouse Electric Corporation.

1:15 p.m. Luncheon—Westinghouse Cafeteria.
(Guests of Westinghouse Electric Corporation).

2:30 p.m. Inspection trip of the Buffalo plant of the Westinghouse Electric Corporation, starting at the cafeteria.
NOTE: This is the world's largest plant devoted to the manufacture of electric motors and industrial control.

5:30 p.m. Transportation to the Buffalo Statler.

7:00 p.m. Dinner (Where you will).

Meeting of Wednesday, October 27th

9:00 a.m. Drying and Ventilating Session (continued).
A. E. Montgomery, Chairman.
"Drying of Low-Density Wood Fiber Products in Roller Driers", by Arthur S. Holden, The Coe Manufacturing Company, Painesville, Ohio.

10:00 a.m. Mill Maintenance and Materials Session:
George Pringle, Mead Corporation, Chillicothe, Ohio, Chairman.
"Electrical Cables in the Pulp and Paper Industry," by F. V. Calvert, General Electric Company, Schenectady, N. Y.
Discussion by E. W. Davis, Simplex Wire & Cable Company, Cambridge, Mass., and E. E. McIlveen, Okonite Company, Chicago, Ill.
"What the Maintenance Department Can Do with Cutting and Welding", by Jamison Moore, Union Bag & Paper Corporation, Savannah, Ga.

12:30 p.m. Luncheon (Where you will).

2:00 p.m. **Round Table Sessions:**

I. Heating and Ventilating:
A. E. Montgomery, Moderator.
Subject: Discussion of Problems Submitted.

II. Mill Maintenance and Materials:
Frank La Que, International Nickel Company, Moderator.
Subject: Corrosion Problems Submitted.

III. Engineering Research and Machine Design.
Philip H. Goldsmith, Moderator.
Subject: Flow of Stock in Pipes.

IV. Materials Handling:
George R. Wadleigh, Moderator.
Subject: Discussion of Problems Submitted.

V. Steam and Power.
J. E. A. Warner, Moderator.
Subject: Fly Ash Disposal and Use.
Subject: Bark Burning in Paper Mills.

6:30 p.m. Get-together Party (Guests of Westinghouse Electric Corporation).

7:30 p.m. Dinner (Hotel Statler).
R. S. Kersh, Manager, Industrial Sales Department, Westinghouse Electric Corporation, Toastmaster.
"The Theatre of Atoms".
NOTE: The Theatre of Atoms is a spectacular and highly educational demonstration that attracted large crowds at the Grand Central Palace in New York City during September.

Program of Thursday, October 28th

9:30 a.m. Visit to plant of the Lockport Felt Company, Newfane, N. Y.

12:30 p.m. Luncheon.
Guests of Lockport Felt Company.

2:00 p.m. Visit to mill of The Upson Company, Lockport, N. Y.

4:00 p.m. Return to Buffalo Statler Hotel.

Third Annual Seminars Pacific Coast TAPPI

Continuing the outstanding series of annual "TAPPI Seminars" offered by the Pacific Section of TAPPI, Dr. Holgar Erdtman, Professor of Organic Chemistry at the Royal Institute of Technology, Stockholm, Sweden, and his wife and collaborator, Dr. G. Aulin-Erdtman, recently presented the third TAPPI Seminar dealing with "The Chemistry of Lignin and Some Non-Carbohydrate Extractives of Wood." The first Seminar was given two years ago by Dr. Emil Heuser and last year Dr. H. Mark served as the lecturer. Both prior Seminars have been concerned with cellulose.

This year two identical two-day Seminars were held. One group met in Seattle at the University of Washington Chemical Laboratories on August 30th and 31st, and the other at the Multnomah Hotel in Portland, Oregon on September 2nd and 3rd. Four sessions were held in each city. At each meeting Dr. Erdtman lectured for about two hours and one following hour was taken up by lively discussion of the points raised in his interesting lectures.

At the first meeting Dr. Erdtman reviewed current knowledge of the location of lignin in plant tissue, methods of isolation of lignins, and modern concepts of the chemical structure of the material. He placed particular emphasis upon the chemistry of the cambial layer and upon the interesting relationships existing between the chemical structure of such substances as conidendrin and similar compounds of the lignin type.

The sulfonation of lignin was discussed during the second meeting along with the mechanism of sulfite pulping. It appears that the removal of lignin during sulfite pulping occurs in two steps; firstly, lignin is sulfonated *in situ*, and secondly, sulfonated lignin is hydrolyzed from its combination with carbohydrates or other lignins, perhaps simultaneously becoming further sulfonated, and then dissolves. Dr. Erdtman has found the procedure of Kullgren for isolation lignin sulfonic acids with low degrees of sulfonation (about 1 S/4 OCH_3) particularliy useful in his study of the sulfonation of lignin. Isolated Kullgren lignin sulfonic acids have in some cases been further sulfonated nearly completely, (i.e. to about 1 S/1 OCH_3) with no substance change in ultraviolet spectrum. Concentration of hydroxyl groups in the Kullgren acids has been measured by Dr. Erdtman by use of his acetylation procedure conducted in the cold with acetic anhydride in pyridine solution on pyridinum lignin sulfonate salts. By application of this method, Dr. Erdtman has secured results which have led him to the conclusion that sulfonation of lignin occurs by replacement of a hydroxyl grouping of the lignin. He believes that Freudenberg's theory of sulfonation as involving the opening of a pyran or furan ring is untenable. Dr. Erdtman stressed the scientific importance of the Kullgren acids in that those structural units of these lignins which are not sulfonated appear to be essentially unchanged from their natural state and consequently scientific work conducted with such preparations should be of particular significance.

The third lecture was devoted to consideration of effects on the sulfite pulping process of the presence of such substances as pinosylvin and pinosylvin monomethyl ether. These substances, if present may condense with lignin during the sulfite process in such a manner as to render the lignin incapable of being removed from the wood by the sulfite process. The taxifolin recently found by Pew to be present in Douglas fir wood appears to react similarly. Other such substances are under study. Dr. Erdtman was reluctant to comment on the changes undergone by lignin under alkaline conditions such as in the soda or kraft pulping procedures. He said that these reactions are complicated indeed and wished to leave the problem open pending development of more experimental evidence.

In Dr. Erdtman's last lecture, the chemical structure and occurrence in various softwoods of many phenolic type extractives was discussed. The existence of particular substances in woods has been to some extent related to the botanical classifications of the several species. Dr. Erdtman is actively continuing his work in this as well as in the lignin field. Many types of wood remain to be investigated to ascertain the nature and extent of biologically active substances present. It was

of particular interest to hear that the substances alpha—and also gamma—thujaplicin have been isolated in Dr. Erdtman's laboratory from Western Red ceder and that these substances appear to be responsible for the resistance of Western Red cedar to attack of insects. Dr. Erdtman stressed the importance of the "long view" in forestry not only with respect to sustained yield management of forests but also in connection with maintainence of the proper biochemical balance between one species of tree with another and with the symbiotic organisms of the soil. A most interesting chart was displayed setting forth the nature of some of these balances. In closing Dr. Erdtman emphasized that much fundamental research remains to be done in the field of wood and lignin chemistry and that this must be pressed with utmost vigor.

Names of those attending the Seattle and Portland Seminars are given below. Distinguished guests at the Seattle seminar were Dr. Claude S. Hudson of U. S. Public Health Service of Washington, D. C., a world authority on sugar chemistry, and also Dr. E. C. Jahn, Professor of Forest Chemistry at Syracuse University who became well acquainted with the Erdtmans during his recent visits in Scandinavia.

The Erdtmans arrived in the United States via Scandinavian Air Lines about August 10th, participated in the Lignin Round Table held in Appleton, Wisconsin, and subsequently in meetings of the Fundamental research Committee of TAPPI in Madison, Wisconsin, and then presented the TAPPI Seminars in Seattle and Portland. After a week during which they visited mills and forest lands on the West Coast, thev presented papers at the Lignin Symposium held by the American Chemical Society in Portland, Oregon. They then travelled on the West Coast to see the redwood forests and other sights of California, expecting to return to Sweden from New York about October 1st.

Registration

Third Annual TAPPI Seminar Seattle, Wash., Aug. 30-31, 1948

Carl Adolphson, Gunhild Aulin-Erdtman, Berry W. Bailey, Henry E. Becker, H. K. Benson, L. K. Bickell, Gordon K. Bonham, A. H. Bowen, Collis C. Bryan, Allen M. Cardigan, Carl C. Castle, O. K. Chapman, Robert T. Connolly, A. G. Cozza, William M. Dehn, Holger Erdtman, Al Graef, Gerald F. Green, Earl G. Hallonquist, Claude S. Hudson, R. E. Hungate, Edwin C. Jahn, Nicholas A. Jappe, Reino Jarvi, Norman S. Lea, Joseph L. McCarthy, John G. Meiler, Murl Miller, T. W. Nicholson, A. Orup, G. E. Patterson, Donald A. Pearson, Q. P. Peniston, Otto H. Sangder, M. F. Smith, John Stephan, R. W. Stephenson, Malcolm C. Stewart, R. I. Thieme, Graham Trethewey, E. V. White, E. H. Woodruff.

Registration

Third Annual TAPPI Seminar Portland, Ore., Sept. 2-3, 1948

R. L. Albrook, Arthur B. Anderson, W. R. Barber, J. S. Barton, J. F. Bunnett, R. A. Butler, Ed Caulson, Jr., Edward Clapperton, Harland R. Clodfelter, G. R. Cranor, Dr. Holger Erdtman, Mrs. Erdtman, Otto Goldschmid, Kenneth R. Gray, R. S. Hatch, W. M. Hearon, W. F. Holzer. Louis S. Keyser, E. Gray King, G. D. King. E. F. Kurth. B. E. Lauer, Edward G. Locke, Edwin L. Lovell, Warren S. MacGregor, William W. McCann, John M. McEwen, R. L. Mitchell, W. W. Moyer, L. B. Pagter, Everett Reichman, John E. Robison, Leon E. Semke, R. M. True, Ruth M. Watts.

Corrosion Handbook

John Wiley and Sons, Inc. have just issued The Corrosion Handbook, edited by Herbert H. Uhlig of the Massachusetts Institute of Technology and sponsored by the Electrochemical Society, Inc. (1188 pp., 6x9).

This is a comprehensive work including basic theory; corrosion behavior — aqueous and atmospheric — of metals and alloys; corrosion behavior at high temperatures; protection against corrosion; and corrosion testing.

Nearly 100 contributors participated in its preparation, many of whom are well known to the pulp and paper industry and are members of TAPPI.

In view of the tremendous losses experienced due to corrosion this remarkable text will be of great value to any industrial plant engineering and technical staff. An amazing amount of factual data which does not seem to overlook any phase of the subject is included. The publishers and the Electrochemical Society are to be congratulated for their enterprise in assembling so much valuable information on a very important subject.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $12.00 per copy.

Chemistry of High Polymers

Interscience Publishers has recently issued a new book "The Chemistry of High Polymers" by C. E. H. Bawn of the University of Bristol (England) (249 pp. 5¾ x 8¾). It is based on a series of post-graduate lectures given at the University of Bristol to industrial chemists.

Among the subjects covered are: Water and classification of high polymers; copolymers; structure and polymerizability; condensation polymerization; addition polymerization; thermodynamics of solution of high polymerizers; size and shape of macromolecules; the structure, stereochemistry, crystallinity and properties of high molescules.

Copies may be obtained from the Book Dept. of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $4.50 per copy in the United States.

Telemetering

Reinhold Publishing Company recently issued "Principles and Methods of Telemetering" by Perry A. Borden and Gustave M. Thynell of the Bristol Company. (230 pp. 6x9)

This book deals with various methods of remote control measurement, a practice that is finding increasing application in the pulp and paper industry.

Among the subjects covered are: current, voltage and frequency systems of telemetering; impulse systems; interconnecting circuits and channels; coordinating, totalizing, computing, and integrating; remote reading of dials and registers; selection and application of telemetering systems; list of patents.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $4.50 per copy.